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Notes on Corticium Oakesii, B. & C., and Michenera Artocreas, B. & C.

By George James Peirce.

Plate CX.

In the order Thelephoreæ there are many interesting species of fungi, of which the greater number grow upon the bark of trees. I wish to speak in this paper somewhat in detail of the structure of the species first described by Berkeley and Curtis as *Corticium Oakesii*.

In and upon the bark of certain species of Salix the mycelium of *Corticium Oakesii*, B. & C., spreads, forming at last a hymenium which is nearly if not quite sessile. It is shaped like a flat bowl, greyish or flesh colored, and consists of a margin of rather closely compacted hyphæ, and of the hymenial surface proper which is composed of somewhat club-shaped basidia separated from one another by hairs which are branches of ordinary hyphal threads, and constitute true paraphyses.

The paraphyses, which are short and also somewhat club-shaped, are thickly beset at their tips with short, bristle-like processes (see figure a) upon which, at certain stages at least, conidial spores may be borne. After the paraphyses have attained to such a bristly developement that they have the appearance of test-tube brushes, some of them (see figure d) begin to grow again at their tips. Those threads which do not resume their growth lengthwise become stouter and more abundantly clothed with bristles than the others. The second growth is always separated from the first by a more or less pronounced constriction (see figs. d, e, f, g) in and below which, as would be expected, the older bristles are found. The second growth is

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generally the last, and when it ceases bristles are again produced as before. If, however, growth is still again resumed, a third set of bristles is sometimes produced at the new tip (see figs. e, f). It is noticeable that the bristles of the second crop, although usually longer and larger than those first formed, are always fewer, generally only four. Only rarely are there more than three or four bristles in the third set.

In the second crop five or six bristles may be formed, but only four ever reach any considerable size. The paraphyses increase correspondingly in size and length. Four of the bristles grow large and long, and, though retaining in great part their thinness of wall, become erect, and bear finally on their tips single, large, oval spores. These fully grown paraphyses are therefore basidia whose sterigmata have been developed from simple, small bristles. Both the erect, upward-pointing sterigmata, and the spores which they bear, are surprisingly large. The sterigmata are about 16μ long by 4μ broad, while the bristles to which they correspond are only about 3μ long and of proportionate breadth. The spores (24μ by 16μ) are clear, granular, flesh-colored, with a nucleus, (which, however, is not always evident), and when ripe, are fairly thick-walled. The sterigmata, being thin-walled and slender, are very fragile, so that sometimes it is no easy matter to secure preparations of them. When the basidial spores are pretty well developed, the surface of the hymenium becomes yellowish and powdery, instead of close, smooth, and pallid, as it is while the plant is sterile or bearing only conidia.

When the plant is not producing basidial spores, that is, when it is young or after basidial spores have ceased to form, the bristles of the paraphyses often bear at their tips clear, highly refringent, colorless, spherical bodies about 0.82μ in diameter, which are doubtless conidial spores. There are, therefore, two fertile stages in the life history of *Corticium Oakesii*, the conidial and the basidial.

The basidial spores are therefore like the conidial spores in that they are both non-sexual, borne on bristles, or upon sterigmata which have been derived by development from bristles; but they are unlike the conidial spores in that they are only four

in number, large, and colored. The only extraordinary thing about them is that they are borne on basidia which are modified and developed paraphyses whose bristles have become larger, longer, fewer, and more erect. The development of the spores is similar to that described and figured by De Bary in his "Morphology and Biology of the Fungi, Mycetozoa, and Bacteria," page 64, for *C. amorphum*, Fr.

The paraphyses branch only occasionally and the branches are always given off considerably below the tip, from that part which is still clear and hypha-like. Those branches which I saw were short, but rather large, (see fig. b).

Among the brush-like paraphyses I found numerous threads which resemble the moniliform filaments in the hymenia of *C. amorphum*, Fr. Upon each thread of this sort are from one to six bead-like structures (see fig. c). The one on the tip is generally more constricted than the others. When there is only one bead on a hypha it may become so much constricted from the rest of the thread as to be almost separate therefrom. In this stage it faintly suggests a spore.

Having found some moniliform hyphæ in *C. Oakesii* which resembled those of *C. amorphum*, I examined *C. amorphum* in order to find, if possible, some trace of the bristle-brushes of *C. Oakesii*. In this I was unsuccessful, and, so far as I know, these bristly paraphyses may be considered the characteristic possession of *C. Oakesii*. For this reason, therefore, as well as on account of certain differences in external appearance, etc., I am convinced that *C. Oakesii* is not, as had been supposed by earlier writers and more recently by Mr. A. P. Morgan in his "Mycologic Flora of the Miami Valley," "the same as *C. amorphum*," nor even a variety of the species.

In Grevillea (iii, 172), Cooke gives a brief but suggestive description of the structure of *C. Oakesii* as seen in two American specimens which he examined. He speaks of finding "incipient asci," "large sporidia," and "nodolose paraphyses," and concludes that the "spicules," or bristle-like processes of the paraphyses, are the stalks of conidial spores.

This appears to be the first paper in which the paraphyses with spicules were correctly described and their true nature

pointed out. The "incipient asci" and "large sporidia" were, however, later recognized by Cooke to be basidia containing oil globules resembling sporidia. The "nodulose paraphyses" are, apparently, the moniliform paraphyses which I have just described.

The only other notice of *C. Oakesii* which needs special attention is in the paper by Massee, on the Thelephoreæ, published in the Linnæan Society's Journal, xxv, 120. He says, in *C. Oakesii*, or, as he calls it, *Aleurodiscus Oakesii*, "in addition to normal tetrasporous basidia, which are rare, there are numerous elliptical gonidia produced singly on thick gonidiophores, whereas in *Aleurodiscus Micheneri* I have found large colored gonidia."

In the specimens that I examined, normal basidia were common enough, although not always in fruit. I have seen all the stages from the young and bare basidia to those bearing four ripe spores on erect sterigmata, as I have already described and figured. I could find no trace of "thick gonidiophores," and the only normal thing which at all resembled them was, as I have said, those hyphæ whose tips were so constricted as to be bead-like. But comparing these with Massee's figures, it is evident that these are altogether too simple and commonplace to be what he means. I saw a single basidium, large, thick, and somewhat irregular, upon which was a single stout sterigma bearing a spore (see fig. h). The occasional abortion of two or three of the four sterigmata has often been observed in other genera of fungi. If wholesale abortion had taken place in Massee's specimens he would naturally have found that tetrasporous basidia were rare, and that "large elliptical gonidia produced singly on thick gonidiophores" took their place. Unless such a thing had occurred, or unless Massee was so fortunate as to get specimens of a stage different from any that I have seen, I can understand neither his descriptions nor his figures. Surely the few moniliform hyphæ, thin-walled, slender and clear, are not the gonidiophores of which he speaks, and we must choose between these and aborted basidia if we are to accept his account.

Just as these observations were ready for publication, my attention was called to a paper by Patouillard entitled, "Quelques champignons de la Chine récoltés par M. l'Abbé Delavy," which

came out in the July number of the "Revue Mycologique." In this paper, under the head of *Aleurodiscus Oakesii*, B. & C., he says that the sterile cells of the hymenium are of two sorts; some are simply basidia which have not yet attained their full development; the others, much more slender, and attenuated at both ends, bear at their tips more or less spiniform protuberances; that these last might easily be taken for paraphyses, were it not that he had been able to determine that they appear in the young specimen at the same time as the basidia and never precede them; that it is, therefore, impossible to recognize in these organs the homologues of those filaments which are found in the thecæ of the Discomycetes. He says, further, that in the American specimens which he examined, the spine-bearing cells were about the same in size as sterile basidia. He therefore concludes that these are basidia which never can produce spores, and that they have become sterile because of some other function of which we are ignorant.

Now, since I have seen many of these spine-bearing cells in specimens so young that not a basidium could be seen, these spinous cells do precede the basidia. Furthermore, I have seen, and in the figures I have tried to show, the development of basidia from these spine-bearing cells themselves. It is by the resumption of growth on the part of some of these bristly cells that the basidia are formed, and from the delicate little bristles the thin-walled, large sterigmata are subsequently developed.

From my own observations, which can be confirmed at any time by an examination of the preparations which I have made of the various stages in the development of the basidia and bristle-cells, I am convinced that, in spite of the general accuracy of his account, it must be wrong on this point; that what have always been called paraphyses are paraphyses, and that from these the basidia are directly developed.

Another genus even more remarkable than *Corticium*, also belonging to the Thelephoreæ, is that called by Saccardo, *Michenera*. There is only one species known in the United States, and this is apparently not common. Like the *Corticia*, it grows upon the bark of trees. It possesses a well-marked and almost,

if not quite, sessile hymenium, flat-bowl-shaped, whitish or flesh-tinted without, and rufous within. There is a decided margin to the bowl, formed of closely compacted hyphæ, as in some *Corticia*, and the hymenium itself, when ripe, ceases to be hard and smooth, and becomes powdery from the escape of the ripened spores.

The difficulties attending the study of this interesting fungus, *Michenera Artocreas*, B. & C., have been great. Its rarity, combined with its remarkable structural peculiarities, have been the cause of many confusions of nomenclature, and each student seems to have taken pleasure in re-naming this form. Berkley and Curtis seem first to have specifically described it in their "Cuban Fungi" under the name of *Michenera Artocreas;* but subsequent writers have variously styled it *Artocreas Micheneri*, *A. Michenera*, *Aleurodiscus Michenera*, and *A. Micheneri*. In addition to the confusion in synonomy, the necessarily imperfect descriptions of the earlier botanists have been accepted without thorough verification, and from this source have come some of the errors which I hope to disprove in this paper.

For the sake of clearness, I will begin my description with the young hymenium. It is made up of simple paraphyses, long, slender, and smooth, unicellular, erect, parallel and tolerably close together. Immediately beneath them, that is, at the base of the hymenium, are the ordinary mycelial hyphæ of the plant, running horizontally or obliquely and interlacing among themselves. It is, of course, from these that the paraphyses spring. Presently the tips of some of the hyphæ become erect, swell, and force their way upwards between the paraphyses. The swollen tip becomes more granular than the rest of the hypha. Later each tip is divided off by a cross partition (see fig. k, *Michenera Artocreas*, B. & C.); it increases in size; its walls become thickened, and at the same time, by the contraction of the upper part of the cell, a long, tapering, lash-like structure is formed at the topmost point. Finally, the neck of the tip-cell, which has now grown to be flask-shaped, is closed by the thickening of its walls.

In the meantime, within the cell thus produced at the outer end of a hyphal thread, a spore has been forming. This spore is large, granular, and either colorless or faintly flesh-tinted. When

the spore is ripe, the mother-cell, with its spore inside, breaks off at the partition which divided it from the parent hypha, and, together with many other similar spore-containing cells, lies rather loosely among the filamentous paraphyses until carried away by the wind, or perhaps by some other agent. When the spores are fully ripe, the long, lash-like appendages of the mother-cells show a tendency to curl spirally and to shrivel. It would be interesting to notice whether this has anything to do with the dissemination of the spores.

The spores are formed so uniformly that one may speak of three distinct layers in the hymenium. First, the somewhat loosely reticulated mycelium, which is overlaid by the more closely compacted hyphæ, from which the paraphyses and sporophores arise; then the dense layer of spores in their flask-shaped mother-cells with upward pointing flagella.

Since it was generally agreed to retain *Michenera Artocreas* among the Hymenomycetes, an effort was made to explain the presence of the flask-shaped bodies which I have just described, on the supposition that they were the spores of some fungus parasitic upon a *Corticium;* and this view was supported by the discovery in other places of basidia and spores which had the same appearance as the basidia and spores of a *Corticium.* But I find no evidence that the flask-shaped bodies are the spores of a parasitic fungus, for the hyphæ which bear the spores are the same in form, size and color as the ordinary mycelial hyphæ of the plant, and may with care be traced vertically in the body of the hymenium for some distance.

Generally, in cases of fungi parasitic upon larger or more complex forms, the hyphæ run transversely and rather near the surface of the host, and can, therefore, in sections or dissections, be distinguished or even separated from the host. Such cases as the Hypomyces, which grow on the larger Agaricini, present this character. In *Michenera*, on the contrary, the spore-bearing hyphæ run approximately parallel, deep down into the hymenium, they form nothing like a sheet, and are not much reticulated until they are near the mycelium of the plant. These flask-shaped bodies can be nothing else than large conidial spores.

If one searches in the literature, one will find in Fig. 4, Plate

VI., of Brefeld's "Untersuchungen aus dem Gesammtgebiete der Mycologie," Heft VIII, a figure which closely resembles the structure of the hymenium in *Michenera Artocreas*. This is a figure of *Nyctalis parasitica*, the nature of whose "chlamydospores," has been considered a matter of some doubt.

Basidia and spores have been described as being produced by *Michenera Artocreas*. In the hymenia, the only spores which I have ever seen were those flask-shaped conidia which I have already described. I have seen no traces either of basidia which had not yet developed sufficiently to bear spores, or of old basidia which had ceased to be spore-bearing. Yet on some specimens, growing near the *Michenera*, but, so far as I have observed, never connected with it, are often found large, low, flat hymenia in which at proper times basidia and spores are produced. These hymenia have attained their large size by the confluence of several small ones. This a rather common occurrence in the Corticia. In these hymenia the spores are large, oval, granular, and borne on long, slender sterigmata which spring from thin-walled basidia. The paraphyses, though slender are somewhat club-shaped, instead of filamentous like those of *Michenera Artocreas*. In all these respects the hymenia are Corticium-like. It is not now possible to assert positively that these hymenia have no organic connection with those which undoubtedly belong to the *Michenera;* for it is always a difficult matter to trace a mycelium continuously for more than a short distance. But it is my opinion, formed after careful examination of the specimens at my disposal, that the mycelium which produces hymenia in which are basidial spores, is not continuous with that which sends up hymenia in which are the spores borne in flask-shaped mother-cells. I believe that those hymenia which contain basidia and basidial spores are, as they seem to be, the hymenia of some species of Corticium, and that they have nothing whatever to do with *Michenera Artocreas*.

Never having seen, in any hymenium which was undoubtedly one of *Michenera Artocreas*, any traces of basidia or of spores which looked as if they might have been borne on basidia, I am led to believe that the basidial stage of *Michenera Artocreas* either does not exist at all, or that it is so completely replaced by the

conidial stage (represented by the flask-shaped cells, which I have described, and the spores therein) that it very seldom appears.

The chief character by which modern mycologists recognize *Michenera Artocreas*, B.&C., is the flask-shaped, flagellate conidia. Fresh material of this plant, and if possible an abundance of it, would doubtless disclose to the student much more of interest than I have been able to make out from the herbarium specimens which have been my only material for examination. I have had the good fortune, however, to be able to study all the specimens of *Michenera* in the Curtis collection of Fungi, and also all the other specimens of *Michenera* in the Cryptogamic Herbarium of Harvard University.

In studying both *Corticium* and *Michenera* I have found Böhmer's Hæmatoxylin a valuable aid in bringing out structural characters. It must be observed, however, that acid preparations, such as glycerine and acetic acid, are impossible with this stain; for the acid gradually destroys the color after changing it to a disagreeable reddish hue. On the other hand, alkaline solutions produce a purple, flocculent precipitate. Pure glycerine is the most convenient mounting medium, and if the sections, or macerated fragments, be *slowly* run up from water to glycerine no shrinkage ensues, the color is unchanged, and the preparations may be kept indefinitely.

To Dr. Farlow, professor of Cryptogamic Botany at Harvard University, who very kindly put at my disposal the specimens which I have studied, and who has helped me by counsel and by criticism in preparing this paper, I wish to convey my grateful acknowledgments.

EXPLANATION OF PLATE CX.

Corticium Oakesii, *B.&C.*

a.—Simple bristly paraphysis.

b.—Showing method of branching of paraphyses.

c.—Moniliform or nodulose paraphyses resembling those of *C. amorphum*, Fr.

d.—Young paraphysis which has resumed its upward growth.

e.—Paraphysis in which second crop of bristles has been formed and growth is continued.

f.—Paraphysis, with a second crop of bristles, which will probably go on growing.

g.—A paraphysis which has been developed into a basidium, four bristles only being formed in the second crop, and these bearing large, oval, granular spores. The first crop of bristles is seen below.

h.—A basidium with only one sterizma and one spore.

i.—Detail of a crop of bristles, showing manner of extrusion, position, etc.

Michenera artocreas, B.&C.

k.—A hypha which has swelled at its tip. The tip is already cut off from the parent hypha by a cross partition. The tip is more granular than the rest of the filament.

l.—A tip which has broken from the hypha after the lash-like process from its top has been developed. The walls are still thin and the spore has not been formed.

m.—A tip cell whose much thickened walls enclose a dark granular spore (sp). The flagellate tip shows some tendency to curl. The neck of the mother-cell is almost completely closed by the thickening of its walls.

n.—A section through the hymenium of *M. artocreas*.

I.—Layer in which filamentous paraphyses are the principal elements.

II.—Spore-layer, mother-cells of spores lying loosely among filamentous paraphyses.

III.—Layer of spore-bearing hyphæ which are separated from each other by paraphyses.

IV.—Mycelium at base of hymenium, showing that both paraphyses and sporophores are continuous with ordinary mycelial hyphæ.

CRYPTOGAMIC LABORATORY,
Harvard University, June, 1890.

New or Noteworthy North American Phanerogams.—III.

BY N. L. BRITTON.

RANUNCULUS PORTERI, n. sp. § Batrachium. Submersed, apparently several feet long, freely branching. Leaves petioled, the petioles ½′ to 1′ long, and dilated at the base, the blade about 1½′ in diameter repeatedly ternately divided into linear or capillary segments; the upper shorter and broader; flowers white, 3″ to 4″ broad, peduncled; achenes 6 to 12 in a head, obliquely oval, compressed, somewhat pubescent, marginless, very nearly 1″ long, beakless or with a mere apiculation, irregularly rugose transversely; receptacle pubescent.

I noticed this plant in Dr. Porter's Herbarium a year or so ago. The accompanying label has only "Henry's Fork, No. 1062; *Ranunculus*, entirely immersed." It was collected on the Hayden Survey of the territories, but I cannot place the exact locality.

The species differs from any form of *R. aquatilis* with which I am acquainted, in its much broader and fewer leaf-segments and larger achenia. I sent it to Mr. Baker at Kew, who thinks it not related to any European form of that plant, remarking that "no European form ever shows so much transition between float-

ing leaves and capillary leaves as this does." Its affinity with *R. aquatilis* is evident, however, from its beakless, rugose pubescent achenia and hairy receptacle.

I refer here, with considerable hesitation, the plant collected by Professor Greene at Ione, Cal., June 7, 1889, and the species may occur in British Columbia.

Capsella procumbens (L.), Fr. Mant. Nov. Fl. Suec. i. 14 (1832). Reichenb. Ic. Flor. Germ. et. Helv. ii. t. xi. f. 4221 (1837).

Lepidium procumbens, L. Sp. Pl. 643 (1753).

Hutchinsia procumbens, D.C. Prodr. i. 178 (1818).

Capsella elliptica, C. A. Meyer, Verzeich. Pflanz. Cauc. 194 (1831).

Hymenolobus divaricatus and *H. erectus*, Nutt. in T. & G. Fl. N. A. i. 117 (1838).

Capsella divaricata, Walp. Rep. i. 175 (1842).

I was first led to investigate the relations of the Old and New World plants which have been described under the above-cited names from finding them all united in the Kew Herbarium. An examination of the specimens there preserved and subsequent study of an extensive suite at home have convinced me that they are all one species, adding another to the list of circumboreal plants. In Europe it extends south to the Mediterranean region, in Asia to Thibet, and it apparently occurs also in Australia. On our own continent it has been found in Labrador by Mr. J. A. Allen (along the seashore, Dead Islands, lat, 52° 48′) and it is widely distributed over the far west as far south as Utah and Lower California.

Hypericum Canadense, L. var. *majus*, Gray Man. Ed. 5, 86 (1867).

A study of this plant in the field and herbarium leads me to think that it has good claim to specific rank. Its characters of lanceolate, acute, 5 to 7-nerved leaves, greater size and longer and sharper calyx-lobes seem quite constant. I have not seen it growing with the typical *H. Canadense*. If they could be found together, important evidence might be obtained. I do not propose here to elevate it to specific rank, but only to call attention

to it in the hope that it may be investigated. Its range is given by Prof. Coulter (Bot. Gaz. xi. 110) as "Canada to Pennsylvania, Illinois and about the Great Lakes," but by Watson and Coulter in the 6th edition of Gray's Manual "L. Superior, Robbins, S. New York and southward." These are contradictory. Specimens from Vermont, New Jersey, Illinois and Iowa are preserved in the Columbia Herbarium.

Calandrinia pygmæa, A. Gray, Proc. Amer. Ac. viii. 623 (1873).

Talinum pygmæum, A. Gray, Amer. Journ. Sci. xxxiii. 407 (1862).

There is an Australian species so named by F. Mueller in Fragm. Phytog. Austr. i. 175 (1858) and recognized by Bentham in Flora Australiensis. I would therefore propose for the American plant the name C. GRAYI.

Crotalaria retusa, L., was collected by Mr. Blodgett on Key West, Florida, many years ago. It does not appear to have been reported from the United States before, but might be expected, as it grows throughout tropical America.

LOTUS HELLERI, n. sp. (*Hosackia Purshiana*, Torr. & Gray, Fl. N. A. i. 327 in part). Erect, annual, divaricately branching 1° to 2° high, finely pubescent or glabrous, leafy; branches ascending, 6′ to 8′ long, slender; stipules; leaves sessile, 3-foliolate; leaflets linear or linear-oblong, acute, entire, the terminal one slightly longer stalked than the lateral ones which are somewhat inequilateral; peduncles 1-flowered, axillary, slender, about 8″ long in fruit, leafy-bracted at the summit; keel yellowish about 3″ long; wings yellowish, tinged with pink; standard pale pink; calyx lobes linear, equalling or slightly exceeding the tube; pod linear, glabrous, 1′ to 1¼′ long, 1½″ wide, acute, 5 to 6-seeded, deflexed at maturity.

North Carolina (Schweinitz) Mecklenberg Co. (M. A. Curtis) Salisbury, Rowan Co. (A. A. Heller). Named in commemoration of Mr. Heller's recent collecting trip in North Carolina, on which a number of rare and interesting plants were obtained. *Lotus Americanus*, (Nutt.) Bisch. Litt. Ber. Linnæa, 1840, 132, (*Hosackia Purshiana*, Benth.), with which this has been confounded, has larger and broader leaflets, is more villous, and has the calyx more deeply cleft. I believe that it has not been found

east of the Mississippi, but ranges from Minnesota to Sonora. The widely distributed plant of the Pacific Coast, also mixed up with *Lotus Americanus*, appears to me quite distinct, as Nuttall made out, describing it as *Hosackia elata* (In T. & G. Fl. N. A. i. 327) and there may be, as he also thought, several other closely related species in California and the Northwest.

Psoralea Reverchoni, S. Wats., Proc. Amer. Acad. xxi. 449, originally described from specimens collected by Mr. Reverchon in western Texas, in 1877, was also found by Dr. Palmer in the Indian Territory, 1868 (No. 72).

Psoralea corylifolia, L. is in Dr. Chapman's Herbarium, ticketed "Appalachicola, introduced." It is an Asiatic species, close to *P. dentata*, DC. of southern Europe.

Cassia crotolarioides, Kunth, var. *leucophylla*, Benth. There is a specimen so determined in the Kew Herbarium, collected by Prof. Mosely in the Grand Canon, Colorado Plateau, Arizona, 1884. The species is known in north Mexico, and its occurrence in this region might have been expected.

Ilex montana, T. and G. var. MOLLIS (A. Gray). *Ilex mollis*, A. Gray, Man. Ed. 2. Leaves as in the type, but pubescent beneath. Burgoon's Gap, Penn. (Porter). Pocono Plateau, Penn., collected by myself on the Torrey Club Field Excursion, June 7–10, 1889.

This plant was first referred to *Ilex dubia* (Don.), B. S. P. Prel. Cat. N. Y., but on comparison with typical specimens of this species from the Alleghanies of North Carolina, Georgia and Alabama, it appears hardly possible that this disposition of it is correct. *I. dubia* has broadly ovate, oval or even obovate leaves, which are rarely acuminate and commonly obtuse, and are much more densely and softly pubescent beneath.

Ilex mollis was founded on the Pennsylvania plant, and the southern species subsequently referred to it. I am maintaining *dubia* as the specific name of the latter on the authority of Dr. Gray, who probably saw a type of it. But from Don's description of *Prinos dubius*, (Gard. Dict. ii. 20), this would not be certain, and he says it occurs from New Jersey to Carolina, while the plant which I know as *dubia* is not reported north of North Carolina.

Ilex verticillata (L.) A. Gray, var. *tenuifolia*, Torr. Fl. North. States, 338 (1824). This variety with thin, obovate leaves, glabrous, except a slight pubescence along the midvein on the under surface, and with mucronate-tipped, appressed teeth, originally collected by Dr. Torrey in the cedar swamp at New Durham, has recently been collected by Mr. W. M. Whitfield at Mt. Washington, Berkshire Co., Mass.

Var. *padifolia* (Willd.), T. and G. in S. Wats. Bibliog. Index, i. 220, is distinguished from the type by its smaller, thicker (almost coriaceous), broadly oval or nearly orbicular leaves. The original specimen in Herb. Torrey came from Lake Erie. The plant is common on the Pocono Plateau of Pennsylvania.

Professor Trelease, in his review of North American species of *Ilex* in Trans. St. Louis Acad. Sci. Vol. V., does not recognize either of these varieties, but they appear to me certainly well-marked enough to warrant consideration.

SPIRÆA VIRGINIANA, n. sp. A glabrous shrub, the branches forming long wands, erect or reclining, 1°–4° long. Leaves oblong or slightly oblanceolate, thin, obtuse or short-pointed at the apex, rounded or cuneate at the base, 1½′–2′ long, 5″–8″ wide, green above, pale beneath, entire or with a few low serrations in the upper half; petioles 2″ long; pedicels and peduncles pale and glaucous; flowers about 2″ broad, in terminal compound corymbs 1′-3′ across; calyx teeth 5, triangular, blunt, about the length of the short-campanulate tube, distinctly glaucous; petals 5, white, ovate-orbicular, obtuse, stamens 15–20, persistent; styles 5–6; follicles in the specimens examined 5–6, apparently sterile, included in the persistent calyx.

On damp rocks along the Monongahela River, Morgantown, West Virginia, collected by Dr. C. F. Millspaugh in flower, June 20th, 1890, and in apparently imperfect fruit late in September. Collected also by Mr. G. R. Vasey in the mountains of North Carolina, 1878.

Spiræa betulæfolia, Pall. and *S. corymbosa*, Raf., have much longer follicles exserted beyond the calyx, broader, thicker and dentate leaves, and are different in habit. Rafinesque published a number of species in his New Flora, but none of them can apply to this one.

LUDWIGIA ALTERNIFOLIA, L., var. LINEARIFOLIA, n. var. Two or three feet high, divergently branched, the branches ascending. Leaves linear, elongated, 2′–4′ long, 1½″–4″ wide, acute; flowers solitary in the axils of the upper leaves or bracts, yellow; sepals ovate-lanceolate acute, narrower than those of *L. alternifolia*; branches and both sides of the leaves somewhat pubescent. Petals apparently remaining on the plant longer than those of *L. alternifolia*, which, as Dr. Millspaugh observes, commonly fall away when the plant is shocked.

Appearing very distinct from typical *L. alternifolia*, but presumably but a variety of it. From the description it may be the *Rhexia linearifolia*, Poir. in Lam. Encycl. vi. 2, said to come from Carolina.

Leontodon hirtus, L., long known from the ballast grounds of the eastern seaports, is becoming more widely adventive. It has recently been collected in Southern New Jersey by Dr. J. E. Peters, at Cold Spring Harbor, Long Island, by Mr. Geo. D. Hulst, and on Vancouver Island, British Columbia, by Prof. Macoun. It certainly claims recognition as an adventive plant.

Populus heterophylla, L. Another locality for this rare tree in the Middle States has been discovered by Rev. L. H. Lighthipe, near Woodbridge, Middlesex Co., N. J. The stations now known for it at the north, besides those given in my "Catalogue of Plants from New Jersey," and its somewhat wide distribution on Staten Island, are Northport, Long Island, and Guilford, Conn., as recorded by Professor Sargent in his Forestry Report in the Tenth Census.

Eriocaulon Körnicikanum, Van Heurck et Muell. Arg. Obs. Bot. 101 (1870). This species does not appear to have been alluded to by any American author. I know nothing more about it than the description given by the above named authors. The plant was collected in eastern Texas by Chas. Wright, and is mentioned here only to call it to the attention of our botanists. It can hardly be Drummond's No. 409 (second coll.), which I take to be *E. Benthami*, Kunth., although without sufficient examination to warrant certainty.

Cyperus phæocephalus, Griseb. Plant, Lorentz. 216 (1874), may be reported from mountains between Mazatlan and Durango,

Mexico, collected by Mr. Forrer in 1887. Specimens were sent me by Prof. Greene. It occurs along the Andes of South America from Ecuador to Argentina. (Spruce, 5,904; Mandon, 1,394; Rusby, 100).

CYPERUS BLODGETTII, n. sp. Section Mariscus. Perennial, from a tuberous thickened base, 8′-9′ high. Roots fibrous; leaves linear, 3′-4′ long, about 1″ wide, glabrous, smooth on the edges; culm sharply triangular; involucre of about three leaves, 1′–2½′ long; inflorescence of 1–3 dense globose heads, 5″–8″ in diameter; spikelets 20–40, 6–10-flowered, the lowest glume empty, the others fertile; glumes keeled, oval or ovate, obtusish, strongly about 9-nerved, about ½″ long; achenium oblong, about two-thirds the length of the glume, triangular; falling away with the glumes from the rachis at maturity; rachis strongly scarred with the bases of the flowers; stamens three?

Key West, Mr. Blodgett (Herb. Torrey and Herb. Gray).

I went over this species with Mr. Clarke at Kew in 1888 and we decided that it must be new. Mr. Clarke, maintaining that *Mariscus* is distinct as a genus from *Cyperus*, proposed calling it *M. avenicola*, and if this view is to be adopted, the plant may bear this name. But I have not been able to agree with him in this respect. The species appears nearest to *C. Grayii*.

The Flora of the Summit of Mt. Monadnock, N. H., in July.

Mt. Monadnock lies in Cheshire County, in the southwestern part of New Hampshire, and can be reached in four hours from Boston, Mass., thus bringing a most interesting botanical region within easy access to lovers of botany. A few words as to the vegetation on the immediate summit may prove of interest. The mountain is 3169 feet high and rears its bald head into the sub-alpine region, thus presenting botanical features much resembling those about the Half Way House, on Mt. Washington, New Hampshire.

I visited the top of Monadnock, July 22nd, 1889, on a beautiful clear day. The thick woods that clothe the slopes of the mountain cease within a half mile of the summit and the bold, bare rocks, with many an overhanging cliff, afford no easy ascent, though a rough pathway has been traced to the top for visitors to the Mountain House, which lies nestled among the trees a mile

from the summit. The view from the summit is magnificent. Dense forests, sparkling lakes, rolling hills, and towns half hidden among the trees, offer a restful picture to the eye. The plants found on the hoary head of the old mountain scarcely exceed a foot in height. The prominent feature consists of *Juncus trifidus*, which grows in small, dense, tough patches between the rocks, and was in good fruiting condition when I gathered it. I was obliged to use my trowel as a hatchet, to hack out pieces of the hard, dry sod. *Poa serotina*, which varies so much in different localities, formed a turf several feet square, by a small pool of surface water, within a few yards of the very summit. The grass, which was of special interest to me, however, and which I met for the first time, at this spot, was *Poa nemoralis*, [*Poa cæsia*, var. *strictior* of the Gray Manual, 5th edition]. It formed a dense sod of several square feet, in a few spots, between the massive boulders. I feasted my eyes upon this interesting grass, which is certainly not common, and stretched out at full length upon it to eat my lunch. The pretty *Arenaria Grœnlandica* was in full flower and grew some distance down the mountain side, forming small patches of snowy white. *Solidago Virga-aurea*, var. *alpina* was very abundant, in full bloom, growing here and there in profusion. The plants were from 2 to 6 inches in height and the radical leaves were fully developed. These leaves varied very much in shape, from almost orbicular with margined petioles to narrowly spatulate and pointed. On the damp slopes about the summit, *Rhodora* was abundant in fruit and, by a clear, cool spring of crystal water, but a minute's scramble down the rocks, I found *Ledum latifolium*, *Carex canescens*, var. *alpicola* was growing from the mountain top to nearly as far down as the Mountain House, while *Potentilla tridentata* was very abundant on the rocks everywhere, in full flower. I found this plant growing abundantly in an open meadow in Jaffrey, N. H., on August 11th, the fruit having fully matured. Creeping up very close to the summit and just perfecting its bright red berries, was *Vaccinium Vitis-Idæa*. It is called Mountain Cranberry and certainly makes an excellent sauce. Expertus dico. A small form of *Eriophorum gracile* was growing among rich sphagnum by a small pool.

These were the phænogamous features of the top of the moun-

tain, within a few rods of the very highest point, and though they do not embrace plants of any special rarity, yet they were of interest to me, as being just what one would expect to find at such an elevation. The absence of any shade whatever and of any rich soil, to any extent, of course excludes many plants that otherwise would be found. On the way up the mountain, in the rich woods, I collected *Ribes rubrum* in fruit, and *Streptopus amplexifolius* was very abundant. Its coral red berries make it a very attractive plant. WALTER DEANE.

The Pinnatifid Leaves of Nasturtium Armoracia.

In Gray's Manual, revised edition, the leaves of this species are described as follows: "Root-leaves very large, oblong, crenate, *rarely* pinnatifid." My observations on the plant, conducted during a long and bitter struggle with it in my garden, lead me to conclude that the pinnatifid leaves are not rare, but periodical in their appearance. The order of the foliation of the plant, as noted by me for the past three years, is as follows: Early in the spring the leaves are small, dissected or dissected pinnatifid. Those next in order are larger and have broader lobes, and after a short time these in turn are succeeded by the broad or summer leaves. Often a single plant will have a series of leaves showing a complete gradation from the dissected to the broad blade. The broad leaves are characteristic of the summer state of the plant, and I have never seen a pinnatifid leaf in midsummer. Early in the fall the new leaves as they appear have more deeply crenate-toothed margins, and as the season advances, many of the plants send out truly pinnatifid leaves again. There are indications that this would be the case with all if the season of growth were longer, for the buds of all usually contain undeveloped pinnatifid leaves when the frost kills the foliage. In October of the present year, every plant, in over forty which I examined, had some of the leaves pinnatifid. As the plant appears in our gardens there is no assignable cause for so marked a change of foliage. The history of the plant, so far as I can find out, is silent as to its habits in the wild state, but it prefers, in this country, rich wet ground, rarely thriving on high and dry soils. This fact, taken in connection with others, as the habits of allied

plants, notably *N. lacustre*, and that many aquatic exogenous plants have dissected leaves, would lead to the conclusion that our plant had been an aquatic at some period of its history. My own conclusion in regard to it is that it was originally an aquatic, but under a gradual change of condition of its surroundings, probably the drying up in summer of the shallow water in which it lived, it acquired a form suitable for emersed conditions, became amphibious as it were. Possibly it would be better to suppose a marshy habitat, subject to fall and winter overflow, but as ponds and lakes usually preceded marshes it is perhaps best to trace this interesting case of heredity, if such it be, to them rather than to marshy ground. CHAS. A. DAVIS.

Alma, Mich., Oct. 25, 1890.

Botanical Notes.

Appointment of Dr. Thos. Morong to the Curatorship of the Columbia College Herbarium.

After an absence of over two years in southern South America, during which time he has collected a very large and valuable representation of the plants of that region, Dr. Morong has returned in health and safety. All botanists will bid him cordial welcome, both on his safe return and his entry upon a new sphere of usefulness and activity. The trustees of Columbia College have appointed him to be Curator of their herbarium, a position which has not been occupied since the death of Mr. P. V. LeRoy. In this appointment an important step has been made in the progress of American systematic botany. N. L. B.

Hepaticeæ Britannicæ Exsiccatæ, Carrington and Pearson; Fas. IV., Nos. 216-290; price 1£ 10s., Manchester, Eccles, England. As many of the British species are common to America, we take pleasure in commending these neatly prepared sets. They are bound in cloth, large octavo. We may state here that the hepatic collections of C. F. Austin were purchased by Messrs. Carrington and Pearson, so that it is to them that we must look for comparisons with many types of American species.

New Localities.—Ligusticum Scoticum, L. A few plants of this species grow beside the salt creek on the west side of Black Point,

East Lyme, Conn. A pretty close search of the salt marshes in this vicinity has failed to discover it at any other station, so that it must be accounted very rare in the State. It has, however, been collected by several persons on Fishers Island, N. Y., and is reported from Watch Hill, R. I., just over the Connecticut State line, but whether it is abundant or rare at these points I cannot say.

Desmodium sessilifolium, Torr. & Gray. This species was found in the extreme south part of the town of Norwich, Conn., near the track of the N. L. N. R. R. On the north shore of Trading Cove, which separates Norwich from Montville, rises a steep rocky and sandy hill covered with a mixed growth of hard woods, pitch pines, and hemlocks. The *Desmodium* grows, not very abundantly, on the warm southern slopes of this hill. More or less is to be found also along the banks of the railroad which here runs close along the west bank of the Thames river. Unfortunately the herbage beside the track is mowed so frequently that the plant does not get the chance to spread that it would otherwise have. Whether this species occurs also on any of the neighboring hills, or on the east side of the Thames, as seems not improbable, the writer has had no opportunity to ascertain.

CHAS. B. GRAVES, M.D.

New London, Conn.

Reviews of Foreign Literature.

Sur certains Rapports entre L' Arabie Heurense et L'Ancienne Egypte, résultant de son dernier Voyage au Yémen; par le Dr. G. Schweinfurth. M. E. Autran, Genève, 1890.

Situated on the high road to India, the southwest corner of Arabia has been from time immemorial the rallying point for all the tribes of the far east, and notwithstanding its accessibility and reputed character for hospitality, it has been a comparatively little traveled country. The history of botanical exploration in Yémen began 128 years ago, when Peter Farskal joined Karsten Niebuhr's remarkable expedition and six months later died in Arabia, leaving a valuable collection of scientific documents, which were published by Niebuhr under the title of "Flore Ægyptiaco-Arabique." Forskal's plants are now pre-

served at Copenhagen. Seventy-four years later a French botanist, P. E. Botta, collected in southern Arabia and his plants are now in the Muséum du Jardin des Plantes at Paris. In 1825 G. Erenberg and Hemprich explored Qunfuda and the surrounding valleys and their collections are among the most valuable in the Berlin museum. Albert Denflers traveled through Yémen in 1887 and during the winter of 1888-89 Dr. Schweinfurth collected 920 species and confirmed many of Forskal's discoveries. The ancient Egyptians cultivated certain trees, dedicated to certain divinities, and among them were the Persea of the ancient Greeks (*Mimusops Schimperi*,) and the Syeamore; the leaves and fruit of both trees having been frequently found in ancient tombs, where they had been deposited as offerings. The "Persea" (not to be confounded with *Persea gratissima*, Gaertn.) has for centuries disappeared from Egypt, but the Sycamore is still found there in large quantites, though only in cultivation. The region of the Upper Nile, rich as it is in Fig-tree species having characteristics that bring them into close relation to the Sycamore, has not as yet shown any in a wild state that might be considered its ancestor. Dr. Schweinfurth gathering from Forskal's notes that in Arabia were to be found species allied to the Egyptian Sycamore, was especially interested in searching for them and learned that the Fig-tree, known as "Chanès" in the mountains and as "Bourra" on the plains, is identical with the Egyptian tree which incontestably has its origin there. He also found the "Persea" growing wild and called "Lebbakh," a term used by the Arab geographers of the middle ages and which to-day in Egypt is appied to an Acacia introduced from India (*Albizzia Lebbek*,) and is now as "Lebbakh," a widespread roadside tree.

The fact that there are in Arabia to-day trees indigenous to the country that several centuries ago, and for three thousand years were considered as sacred in Egypt, may possibly throw great light on the ancient relations of the two countries.

A. M. V.

Algæ Brasilienses a cl. Dr. Glaziou collectæ. M. Mobius. (Notarisia, Anno v. 1065–1090, one plate).

An enumeration of eighty-two species of Brazilian Algæ collected by Dr. Glaziou. No new species are described. The following are figured: *Entocladia viridis, Bryopsis plumosa, Odontothallia microdonta* and *Galaxaura*, spec.

Algæ collected in the neighborhood of Toronto—A Preliminary List of. J. J. Mackenzie. (Proc. Can. Inst. 3d Series, vii. 270–274).

Acineta densa. (Bot. Mag. T. 7143).

Annual Report of the State Botanist of the State of New York. Chas. H. Peck. (Pamph. pp. 54, four plates. Reprint from the forty-third Report of the New York State Museum of Natural History, Albany, 1890).

As usual, Mr. Peck's annual report contains much of interest and scientific value. 229 species of New York plants have been added to the State Herbarium, of which 105 are new to it, besides many extra-limital species. Twenty-three different persons contributed. Mr. Peck's field operations were conducted in several counties. Under "Plants not before Reported," are *Hesperis matronalis*, from Albany Co., *Prunus avium*, from near Catskill, *Trapa natans*, established in Sander's Lake, near Schenectady, *Aster vimineus* not rare in the eastern part of Long Island, *Lacnanthes tinctoria*, Manor, Suffolk Co., *Cynodon Dactylon*, vacant lots in Long Island City. Some of these have, however, been previously found in other parts of the State. The others of this category are Fungi, of which the following are described as new: *Tricholoma grave, Clitocybe multiceps, Coprinus Brassicæ, Cortinarius glutinosus, C. annulatus, C. luteus, C. paludosus, Lactarius subinsulsus, L. mutabilis, Russula brevipes, Marasmius albiceps, Poria aurea, Irpex rimosus, Corticium subaurantiacnm, C. basale, Peniophora unicolar, Clavaria similis, Comatricha longa, C. subcæspitosa, Phyllosticta bicolor, P. Prini, P. Silenes, Phoma allantella, Plasmopora Viburni, Sporotrichum cinereum, Coniosporium Polytrichi, Stachybotrys elongata, Dematium parasiticum, Fusicladium destruens, Macrosporium Polytrichi, Isaria aranea-*

rum, Tubercularia carpogena, Fusarium Sclerodermatis, Glœosporium leptospermum, Underwoodia, a new genus of Helvellaceæ, with *U. columnaris, Helotium mycetophilum, Hæmatomyces faginea, Eutypella longirostris, Lepiota farinosa, Pholiota æruginosa* and *Phellorina Californica*, the three latter species extralimital.

Under "Remarks and Observations," *Ranunculus Clintoni*, Beck, now referred to *R. repens*, still occurs along the Erie Canal between Rome and Oriskany, *Lythrum alatum* occurs at Selkirk, Albany Co., *Sium cicutæfolium*, var. *brevifolium*, a new variety from Cedar Lake, St. Lawrence Co., and many other important notes on distribution.

There is also a monograph of the three New York species of *Armillaria* and a synopsis of those of the United States, and an account by Mr. P. H. Dudley of the growth of fungi on railroad timber. N. L. B.

Aristolochia longecaudata. (Gard. Chron., viii. 493, fig. 98).

Ascomycetes Novi. P. A. Karsten and P. Hariot (Revue Mycol. xii. 169–173).

Includes *Chlorosplenium tuberosum* from Cape Horn, *Nectria Harioti*, from New Granada and *Kullhemia phyllophora* from Brazil.

Black Rot of the Grape—Some Recent Observations on. B. T. Galloway. (Bot. Gaz. xv. 255–259).

Botany at the Indianapolis Meeting. C. E. Bessey. (Am. Nat. xxiv. 958-964).

List and abstracts of the botanical papers read before the American Association for the Advancement of Science, the Botanical Club of the Association and the Society for the Promotion of Agriculture during the August meetings of the present year at Indianapolis.

California Lilies. (Garden, xxxviii. Pl. 776).

Accompanying this article is a colored plate of *Lilium pardalinum, var. luteum, L. Bolanderi* and *L. maritimum.*

Catalpa—The. (Garden & Forest, iii. 533, 534).

Catalpa Trees—Two Remarkable. H. Brooks. Garden & Forest, iii. 536, figs. 68, 69).

Accompanying this article are representations of large individ

uals of *Catalpa bignonioides* on the P. C. Brooks estate at West Medford, Mass. These trees have produced drooping branches which have rooted and produced shoots, thus forming a miniature forest of young *Catalpas*.

Contributions à la Flore du Paraguay—III. Polygalacées. Dr. Robert Chodat. (Mem. Soc. Phys. et Hist. Nat. Genève xxx. No. 8).

Under this title are described twenty-six species of *Polygala* found in Paraguay, twelve of which are beautifully figured in six plates. The drawings bring out clearly the style and seed characters.

Cruel Plant—The. Arthur Henry. (Proc. Can. Inst., 3d Series, vii, 226–229, illustrated).

An account of the method by which *Physianthus albens* catches and holds visiting moths.

Cucumber Root—The. (Am. Garden, xi. 691, illustrated).

Medeola Virginica is figured under this caption.

Dewberries—The. (Am. Garden, xi. 641, 642, illustrated).

Contains descriptions of *Rubus Canadensis*, *R. hispidus* and *R. trivialis*, with fig. of the second named species and a full page representation of *R. Canadensis*, var. *roribaccus*, which is described as a new variety, said to be native in the hills of West Virginia.

Distribution of Plants—The. V. M. Spaulding. (Am. Nat. xxiv. 819–831)

Professor Spaulding reviews in a very interesting manner the historical development of the study of this topic, beginning with Humboldt's essay in 1805. He points out some of the views held by him and subsequent authors, and concludes that the end has not yet been reached. It is to be regretted that this paper was not presented at Indianapolis, so that it might have been incorporated with the others there given, which are to be published as a group in the proceedings of the American Association.

N. L. B.

Eriogoneæ. (Gard. Chron., viii. 525, fig, 103, 104, 105).

Contains figures of *Eriogonum corymbosum*, *E. racemosum* and *E. Thomasii*.

Eriogynia—On the Genus. Sereno Watson. (Bot. Gaz., xv. 241, 242, Pl. xiv).

The discovery of a new rosaceous plant allied to *Spiræa cæspitosa*, Nutt. has determined the author to study certain allied species of *Spiræa* with the result that: "If *Eriogynia pectinata* is rightly separated from *Spiræa*, as I think, then *S. cæspitosa* should rather be joined with it than retained in *Spiræa*, and with it should go our new species, which I have accordingly named *E. uniflora*." Nevertheless the author admits that the differences between the species is so marked that he proposes to divide the genus into three sections as follows: *Eriogynia* proper, represented by *E. pectinata*, *Petrophytum* by *E. cæspitosa*, and *Kelseya* (named in honor of the discoverer, Rev. F. D. Kelsey) for *E. uniflora*. The three species are represented on the accompanying plate.

Eucalyptus and the Honey Bee. Mrs. R. F. Bingham (Bull. Santa Barbara Soc. Nat. Hist. i. No. 2, 32–34).

Eucharis Bakeriana. (Bot. Mag. T. 7144).

Ferns—Native. Mrs. J. T. Power. (Am. Garden, xi. 658–662, illustrated).

Contains figures of *Osmunda cinnamomea*, *O. Claytoniana*, *Aspidium acrostichoides*, *Polypodium vulgare* and *Pellæa gracilis*.

Ferns of the Channel Islands. L. G. Yates. (Bull. Santa Barbara Soc. Nat. Hist. i. No. 2, 8-10).

Polypodium Scouleri found on Santa Cruz.

Flora Brasiliensis—Fasc. CVIII. Cactaceæ. Carolus Schumann. (pp. 186-334, tab. 39-63).

This fascicle completes Vol. iv. Part 2. Twenty genera and about 130 species are described, a considerable number of the latter being new.

Food Plants of the Clover-stem Borer. Clarence M. Weed. (Amer. Nat. xxiv. 867).

Forms of Staten Island Plants. N. L. Britton. (Proc. Nat. Sci. Assn. S. I., Nov. 8, 1890).

The author notes the occurrence on Staten Island of *Sabbatia stellaris* forma *albiflora* and *Aster Novæ-Angliæ* forma *roseus*.

Fruit Plants—The Evolution vnd Variation of. J. H. Bourn. (Trans. Mass. Hort. Soc., 1889, Part i, 14–29).

Lemon—On the Structure and Development of the. L. S. Ross. (Bot. Gaz. xv. 262–267, Pl. xvi).

From what is evidently careful study and examination, the author says: "that every part of the fruit has its origin from some part of the leaf." The pulp clubs are stated to be derived from the leaf hairs, and in this connection it is of interest to note that under the title "The Ideal Ovary," Mr. E. E. Sterns (BULLETIN, xvi. 77) says: "*Apropos* of the Orange I may add here the observation that the stalked, elongated, juice-filled cells of the pulp, springing from the inner surface of the carpellary leaf, are true trichomes in structure and position, and therefore, when we revel in the fruits of *Citrus Aurantium*, we are, morphologically speaking, eating hairs." The excellent figures greatly assist in understanding what has already been written on the subject.

List of Botanists of the Agricultural Experiment Stations in the United States. (U. S. Dept. Agric. Exp. Sta. Bull. No. 6, pamph. pp. 23, 1890).

This paper gives a list of the Agricultural Experiment Stations and their officers, together with a digest of the lines of work now being prosecuted. It was prepared by a committee from the Association of American Agricultural Colleges, consisting of Prof. Halsted, Prof. Scribner and Mr. Galloway.

Lyonothamnus asplenifolius. H. C. Ford. (Bull. Santa Barbara Soc. Nat. Hist. i. No. 2, 56–58).

An account of this beautiful tree as studied by Dr. Yates and Prof. Ford on the island of Santa Cruz.

Medicinal Plants Growing Wild in Santa Barbara and Vicinity. Mrs. R. F. Bingham. (Bull. Santa Barbara Soc. Nat. Hist. i. No. 2, 34-37).

Medicinischen Pflanzen von Alabama—Die. Carl Mohr. Pharm. Rundsch., viii, 257-262).

This part includes the species from Rosaceæ to Filices and terminates the series.

Mock Oranges. (Garden, xxxviii. 413, illustrated).

Under this heading are notes upon *Philadelphus coronarius, P. Gordonianus, P. speciosus, P. microphyllus* and *P. grandiflorus* —the latter figured.

Monographia Generis Coccolobæ. G. Lindau. (Engler's Bot. Jahrb. xiii. 106–229, t. v).

A monograph of the polygonaceous genus *Cocoloba*, including a discussion of its morphology. 125 species are recognised, of which a large number are described as new. *C. Floridana* Meisn. of the Florida Keys is referred to *C. laurifolia*, Jacq., a widely distributed species of the West Indies. A single species only is attributed to Bolivia, bnt Dr. Rusby brought home three from there and Mr. Bang has since collected another.

N. L. B.

Monterey Cypress—The. A. D. Webster. (Garden, xxxviii. 363, illustrated).

Account and representation of *Cupressus macrocarpa* as growing at Castlewellan.

Palms of the California Border—The. S. B. Parish. (Garden & Forest, iii. 542).

The author contends that the identity of the *Washingtonias* near the southern boundary of California is very uncertain and the supposed *W. filifera* of San Bernardino Co. may be *W. robusta*, and if so it would be the proper name for the only true palm known from the State of California.

Pereskia aculeata. (Bot. Mag. T. 7147).

Physianthus albens. Chas. Armstrong. (Proc. Can. Inst. 3d Series, vii, 230, 231).

Apparently an independent account of similar investigations indexed under the heading "The Cruel Plant."

Pinus Montezumæ. (Gard. Chron. viii. 466, figs. 91, 92, 93, 94, 96).

An article describing this species as it is growing in Cornwall, England.

Plane Trees—Origin of the. Lester F. Ward. (Am. Nat., xxiv. 797-810, Pl. xxvii).

The author criticises a recent paper upon this subject by Johann Janko in Vol. xi. of Engler's *Botanische Jahrbücher* and revises the geological distribution of recognized fossil species of the genus *Platanus*. There is considerable diverstiy of opinion between the two authors and there is evidently room for further criticism.

The article is accompanied by representations of leaves of *Platanus orientalis* L., *P. occidentalis*, L., *P. racemosa*, Nutt. and *Sassafras Cretaceum*, Newb.

Plants collected in 1889 *at Socorro and Clarion Islands, Pacific Ocean.* Geo. Vasey and J. N. Rose. (Proc. U. S. Nat. Mus. xiii. 145–149, reprinted).

These islands are situated about 260 miles south of Cape St. Lucas and were visited in 1889 by the Fish Commission steamer "Albatross," the botanical collections being made by Mr. Chas. H Townsend. The following new species are described: *Teurium Townsendii, Cardiospermum Palmeri.*

Promising Wild Fruits—II. A. A. Crozier. (Am. Garden, xi. 649–653, illustrated).

Crabs, Plums, the Buffalo Berry, Cacti and Persimmons are discussed in this contribution, and *Pyrus coronaria* and *Diospyros Virginiana* are figured.

Rubus Arten der Antillen. W. O. Focke. (Abhand. Naturn. Ver. Bremen, xi. 409–412).

Descriptions of the three species known from the West Indies: 1. *R. durus*, Sauv. (Cuba, Wright, 2410); 2. *R. florulentus*, Focke. (Porto Rico, Sintensis 4100; 4669, with var. *Eggersii.* Focke (St. Domingo, Eggers 2065); 3. *R. Domingensis*, Focke (St. Domingo, Eggers, 2281). All three have ternate leaves. There is apparently a fourth species in Guadaloupe.

N. L. B.

Shrubs of Santa Barbara County—The indigenous. H. C. Ford. (Bull. Santa Barbara Soc. Nat. Hist. i. No. 2, 29–31).

A list of about sixty species.

St. Johnsworts—Two American. (Garden & Forest, iii. 524, 525, figs. 26, 27).

Under this heading are described and figured *Hypericum prolificum* and *H. densiflorum.*

The Silva of North America. A Description of the Forest Trees which grow naturally in North America exclusive of Mexico. By Charles Sprague Sargent, Director of the Arnold Arboretum of Harvard University. Illustrated with Figures and

Analyses drawn from Nature by Charles Edward Faxon and engraved by Philibert and Eugene Picart. Volume I. Magnoliaceæ—Ilicineæ. Large 4to, pp. ix+119; 50 plates. Boston and New York. Houghton, Mifflin and Co., 1891.

It is with a sense of profound gratitude and the highest admiration for the immense labor devoted to the work that we cordially welcome the appearance of the first volume of this magnificent book. Professor Sargent has been engaged in the accumulation of the material now collated and given to the world, for a large number of years, and the result will rank with the best classical works on Science and Art that have ever been issued at home or abroad.

The book is sumptuously printed on heavy paper and cut with broad margins. The illustrations are superb. The descriptions are excellent and the notes on geographical distribution, history and economic importance are of the highest interest and value.

The descriptions of genera and species, which follow the sequence adopted in the Genera Plantarum of Bentham and Hooker, are prefaced by an account of the various publications which have been especially devoted to our trees; the earliest being Humphrey Marshall's "Arbustum Americanum" and the most recent noted Professor Edward L. Greene's "West American Oaks."

The author's definition of a tree is certainly the most rational one. He says "The line which divides trees from shrubs is a purely arbitrary one, and an attempt to separate them is often unsatisfactory. A division based on habit rather than on size seems, on the whole, more easily applied than any other, and therefore less objectionable. So, for the purposes of this work I have considered as trees all woody plants which grow up from the ground with a single stem, whatever size or height they may attain." As to the number of species coming within this definition it is stated "The forests of North America, exclusive of Mexico, are now believed to contain four hundred and twenty-two, besides numerous varieties."

The question of nomenclature is treated of in the following sentences: "I have adopted the method which imposes upon a

plant the oldest generic name applied to it by Linnæus in the first edition of the "Genera Plantarum," published in 1737, or by any subsequent author, and the oldest specific name used by Linnæus in the first edition of the Species Plantarum, published in 1753, or by any subsequent author, without regard to the fact that such a specific name may have been associated at first with a generic name improperly employed. The rigid application of this rule leads to the change of many familiar names and considerable temporary confusion. But unless it is adopted, anything like stability of nomenclature is hopeless, and the sooner the changes which are inevitable in the future are made, the more easily students will become accustomed to them and acquire a knowledge of the correct names of our trees." This position will be heartily welcomed by almost every American botanist. Indeed, we believe that the publication of this great work on this principle will practically remove all opposition to the method here adopted, and which some of us have for many years foreseen as the only escape from a very troublesome question.

The following species are described and figured in this volume:—*Magnolia fœtida; Magnolia glauca; Magnolia acuminata; Magnolia tripetala; Magnolia Fraseri; Liriodendron Tulipifera; Asimina triloba; Anona glabra; Capparis Jamaicensis; Canella alba; Gordonia Lasianthus; Gordonia Altamaha; Fremontia Californica; Tilia Americana; Tilia pubescens; Tilia heterophylla; Guiacum sanctum; Xanthoxylum Clava-Herculis; Xanthoxlum cribrosum; Xanthoxylum Fagara; Ptelea trifoliata; Helietta parvifolia; Amyris maritima; Canotia holacantha; Simaruba glauca; Kœberlinia spinosa; Bursera Simaruba; Swietenia Mahogani; Ilex opaca; Ilex Cassine; Ilex vomitoria; Ilex decidua* and *Ilex monticola*. According to our view the correct name of the last is *Ilex montana*.

The Silva will be completed in 12 volumes, to be issued two each year. The price is fixed at $25.00 per volume. It ought to find a place in every public library in this country and abroad and the proprietor of every country place will be one thing short of complete equipment, until a copy of it is within reach in his drawing-room. N. L. B.

Trees of North Eastern America—The. Charles S. Newhall,

with an introductory note by Nath. L. Britton (8vo. New York. G. P. Putnam's Sons. 1890).

This work is an illustration of what has been styled "Delatinized Botany." In it no descriptive terms are used other than those consisting of common English words. Such works are written and consulted under the apprehension that there is an easier and more convenient way of expressing and receiving scientific ideas than by the use of scientific language. That this is a serious misapprehension there is no doubt. It belies the fundamental principle of scientific language, whose precise object is the reaching of the result by the shortest and most convenient method consistent with accuracy. It is true that certain results more or less valuable may be attained by the method of this author; but even where the results are not in themselves erroneous they must in some cases involve false teaching. There is a way of compromising by the admission of the minimum number of technical terms, using them only where it is necessary to avoid giving a false impression—which seems to us much better. For instance Mr. Newhall substitutes for *obovate* the term "inverse egg-shaped." How unfortunate! An egg is ovoid—solid—while ovate refers to a surface. And then, who knows which is the "reverse" way of an egg? The prefix *ob* in *obovate* does not refer to the reversion of the egg, but to the reversion of the ovate shape of the leaf. Both ovate and obovate are the technical creations of scientific language, created for the very reason that they were needed, and in this form as the most convenient one. How much easier, as well as better, for the author to have taught his readers the use of the terms *ovoid*, *ovate* and *ob*, thus elevating them and his subject at the same time, than to have thus misled the one and degraded the other! Is this not ob-education? But it is not intended to decry the attempt to provide useful works for those unable to study nature scientifically. Neither is it intended to decry the value of Mr. Newhall's work; but only to criticise certain false methods which we are sorry to see receiving his support. On the whole we can heartily endorse the statements in the introductory note that there is great need of such a popular work. We anticipate and bespeak for the work a large sale, but we hope that the author will in a subsequent edition substitute graceful and accu-

rate terms for a number of clumsy and inaccurate ones. The illustrations also should be improved, as they are decidedly below the standard of publications of this kind. H. H. R.

Umbelliferæ:—Notes on North American.—II. John M. Coulter and J. N. Rose. (Bot. Gaz. xv, 259,-261, Pl. vv.)

The following are described as new: *Hydrocotyle Bonariensis*, Lam. var. *Texana*, and *Arracacia Donnell-Smithii*, the latter figured.

Yuccas.—Some Good. A. Davenport. (Am. Garden, xi. 666, 667, illutrated.)

Contains a picture of *Yucca gloriosa* var. *recurvifolia*.

Proceedings of the Club.

The Regular Meeting was held on Tuesday evening, Nov. 11th, the President in the Chair and fifteen persons present.

The Chairman of the Committee on Instruction reported favorably on the season's work. The majority of the students are continuing their botanical work.

The paper as announced, "Notes on the Spring Flora of the Southern Alleghanies," was then given by Miss Anna Murray Vail.

Among the many plants shown *Clematis Addisonii*, the new species which Dr. Britton has named for our President, attracted most attention.

The Second November meeting was held Nov. 26th, the President in the Chair and twenty-nine persons present.

Mr. R. S. Williams and F. D. Kelsey were elected Corresponding Members and Mr. F. W. Anderson an Active Member.

The amendment to the Constitution was voted upon and carried unanimously.

The regular meeting days will now be the second Tuesday and last Wednesday of each month.

Dr. Rusby's paper, "Collecting in the Tropical Andes," then followed. At its close the Club listened with great attention to remarks corroborative of Dr. Rusby's experience and descriptive of his own from Dr. Thos. Morong, who has just returned from Paraguay and Chili.

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By resolution of the Club, the subscription price of the next volume of the Bulletin will be $1.00.

The Index to Vol. XVII of the Bulletin will be distributed with the January number.

No. 2, of Vol. II, Memoirs, entitled "Contributions to the Flora of Virginia," containing papers by Anna Murray Vail and Arthur Hollick, with two plates, is about ready for distribution. Price, 75 cents.

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VOL. XVII. DECEMBER, 1890. No. 12.

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OF THE

TORREY BOTANICAL CLUB,

A MONTHLY JOURNAL OF BOTANY.

EDITED BY

NATHANIEL LORD BRITTON,

AND OTHER MEMBERS OF THE CLUB.

CONTENTS:

PAGE.

Notes on *Corticium Oakesii* and *Hickenera grisea* (Plate CX): *Geo. J. Peirce*.... 301

New or Noteworthy North American Phanerogams—III.: *N. L. Britton*..... 310

The Flora of the Summit of Mt. Monadnock, N. H., in July: *Walter Deane*.... 316

The Pinnatifid Leaves of *Nasturtium Armoracia*: *Chas. A. Davis*..... 318

BOTANICAL NOTES.—Appointment of Dr. Thos. Morong to the Curatorship of the Columbia College Herbarium; Hepaticæ Britannicæ Exsiccatæ; New Localities for *Ligusticum Scoticum* and *Desmodium ecastilifolium*: *C. E. Geaves*. 319

REVIEWS OF FOREIGN LITERATURE.—Sur certains Rapports entre L'Arabie Heureuse et L'Ancienne Egypte..... 320

PAGE.

INDEX TO RECENT AMERICAN BOTANICAL LITERATURE.—Annual Report of the State Botanist of the State of New York; Contributions to the Flora of Paraguay; Dewberries; The Distribution of Plants; The Genus *Eriogynia*; On the Structure and Development of the Lemon; List of Botanists of the Agricultural Experiment Stations; A Monograph of the Genus *Cocculus*; Origin of the Plane Trees; Plants collected in 1889 at Socorro and Clarion Islands, Pacific Ocean; The Rubi of the Antilles; the Silva of North America; The Trees of Northeastern North America; Researches on North American Umbelliferæ—II., and briefer notices..... 322

PROCEEDINGS OF THE CLUB..... 332

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INDEX

—TO—

VOLUMES VII—XVI.

BULLETIN

—OF THE—

TORREY BOTANICAL CLUB.

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INDEX

—TO—

VOLUMES VII—XVI.

BULLETIN

—OF THE—

TORREY BOTANICAL CLUB.

COMPILED BY E. G. BRITTON.

NEW YORK,
1890.

GENERAL INDEX.

(Illustrated articles are designated by an asterisk* before the page number.)

A. A. A. S. Botanical Club Meeting at Toronto, xvi., 242.
A. A. A. S. Botanical Club's trip to the Lakes of Muskoka, xvi , 285.
A. A. A. S., xi., 71.
A. A. A. S. Botanical Club Meeting at Cleveland, xv., 254.
Abietineæ, leaves of, xii., 10.
Abutilon, concerning, xi., 19.
Abutilon, note on, x., 132.
Abutilon striatum, note on, xiv., 96.
Abrus precatorius, xii., 54.
Acer, polyphylly of gynoecium in, vii., 56, 97.
" meiophylly " " " vii., 56.
Acolium, n. sp., ix, 22.
Aconitum Noveboracense, Gray, n. sp., xiii, 190.
Acrostichum aureum, growing by fresh-water, x , 12.
Acrostichum Eatonianum, sp. nov , xv , 252.
Actinodiscus Atlanticus, n. sp., xvi., 72.
Adhesion between two beeches, ix, *91.
" in Fagus, ix., *91.
" " Abies, ix., 155.
" " Acer, ix., 155.
" of syncarps in Rubus, ix., 120.
Adiantum Capillus-Veneris in Kentucky, vii., 80, 94.
Adiantum pedatum, dehiscence of the sporangium of, xiv , *180.
Adirondacks, flora of, x., 43.
Adventive leaf in Taraxacum, ix., 11, 129.
Adventive leaves in Pogonia, viii., 108.
Æcidium, n. sp., x., 74, 75 ; xi., 50, 73, 114.
" Bellidis, xi.,32 64.
" Jacobeæ, xi., 93.
Agropyrum, n. sp., x., *128.
" abnormal, x., *78.
Agrostis, n. sp., x., 21.
" elata, cohesion of glumes, viii., *78.
Allanthus, the, xii., 79.
Albinism, xi., 67.
" Chemistry of, vii., 22.
Albinism in Arethusa, vii., 99.
Albinism in Campanula vii., 113.
" Cirsium lanceolatum, ix., 11, 56.
" Cypripedium, vii., 121.
" Geranium maculatum, ix., 36.
" Iris versicolor, ix., 128.
" Lonicera oblongifolia, ix., 36.
" Pontederia, viii., 125.
" notes on, viii., 125.
Albino fruit in Rubus, viii., 129.
" " " Mitchella, viii., 111.
Alchemilla, vulgaris, xiv., 10, 12, 43.
Alder catkins, note on, ix., 57, 84.
Algæ, American fresh-water, viii., *1, 37.
" fresh-water, vii., 43, *91 ; ix., *25 ; x., *13 ; xi., *13 ; xii., *1, 51, *125. 133.
" fresh-water, of Maine, xv., 155 ; xvi., 181.
" marine, New England, x , 55.
" New England, notes on, ix., 65, 69 ; xi., 29, 130.
" check list of marine, xiii., 105.
" Effect of on drinking-water, vii., 100.
" Motion of caused by light, vii., 84.
" Some new or imperfectly known, xvi., *1.
" from Atlantic City, xv., 309.
Allium, adventitious buds in, vii., 69.
" stenanthum, n. sp., xvi., 152.
Alopecurus Californicus, Vasey, n. sp., xv., 13.
" geniculatus, var. robustus, Vasey, n. var., xv., 13.
" Howellii, Vasey, n. sp., xv., 12.
" Macounii, Vasey, n. sp., xv. 12.
Alsodeia ovalifolia, spec., n. xvi., 18.
Alternaria, n. sp., x., 52.
Alyssum, etymology of word, xii., 60.
Amelanchier, a large, x , 70.
Ammophila, n. sp., xi., 7.
Amorpha, fasciation in, x., 136.
Anarcardiaceæ, a supposed new genus from Bolivia, xiv., 143.
Andropogoneæ, List of North American, xvi., 233.
Andropogon Jamesii, note on, ix., 52.

Anemone, or Thalictrum, which? x., 56.
" acutiloba, Lawson, Dicœcism in, xiv., *119.
Annotations, xiv., 228.
Anthers, alternate dehiscence of, vii., 59.
Anthesis in Ericaceæ, xii., *16.
Anthophyta for Phænogamia, xv., 20.
Anthostomella, n. sp., xi., 42.
Anthoxanthum, viviparous, vii., 98.
Antirrhinum, n. sp., x., 126.
Anychia, notes on the species of the genus, xiii., 185.
Aphyllon fasciculatum, xvi., 330.
" " in Montana, xvi., 215.
" uniflorum, parasitism of, vii, 67.
Apios, nectar-glands of, xi , *123.
Apple-tree, a large, x., 134.
Apple-tree, weeping, vii., 121.
Apospory in ferns, xii., 42.
Aquilegia, the word, xii., 57.
" Canadensis, L., var. flaviflora, xv., 97, 165.
Aralia nudicaulis, L., a new variety of, xiv., 166.
Arceuthobium in New Hampshire, x., 62.
" new station for, ix , 33.
Arenaria, fertilization of, xii., 62.
Arisaema, multiplication of spadices, ix., 90.
Aristida, n. sp., x., 42.
Artemisia, n. sp., x , 42.
Arthoniæ, new, xii., 113.
Arthonia albo-virescens, spec. nov., xvi., 105.
Arthrocladia villosa, ix., 127; x., 106; xii., 62.
Arthrodesmus, n. sp., x., 17, 18.
Artichoke, morphology in tuber of x , *54.
Asa Gray, Death of, xv., 58.
Asa Gray, xv., *89.
Asa Gray. Resolutions of the Hamilton Literary and Scientific Association, xv., 96.
Asclepias, a new species of, viii , 5.
Asclepias, abnormal habit in, viii., 87.
Ash leaves, abnormal, xv., *212.
Aspidium Lonchitis in Colorado, viii., 105.
Aspidium lonchites, note on, x., 40.
Asplenium ebenoides in N. Y. State, vii , 96.
Asplenium rhizophyllum, Kunze, var. Biscayniana, new var., xiv., *97.
Assimilatory system, on the, xiv., 53.
Aster concolor in Rhode Island, vii., 19.
Aster cordifolius, var. lanceolatus, n. var., xvi., 68.
Aster cordifolius, var. lævigatus n. var., xvi., 67.
Asteromphalus Roperianus, Grev., note on a variety of, xiv., *26
Astilbe decandra, D. Don, var. crenatiloba, n. var., xv., 98.
Astragalus capitellus, spec. nov., xvi., 260.
Austin, Coe F., vii., 38.
Aztecs, botany of, xii., 95.
Bacteria, systematic position of, xii., 117.
Bæria, n. sp., x., 86.
Ballast-plants near New York, viii., 141.
Bamboo, fire from, xii., 111.
Bamboo, a square, xii., 120.
Bank notes, micro-vegetation of, xi., 101.
Banyan-tree, xi., 71.
Baptisia tinctoria, xii., 121.
Barbula megalocarpa, n. sp., xvi., 92.
Batrachospermum moniliforme, var. subulatum, n. var., xv., 156.
Bauhinia cretacea, Newberry, n. sp., xiii., *77.
Bauhinia Rusbyi, spec. nov., xvi., 326.
Bean, tricotyledonous, xi., 119.
Beech, a protection from lightning, ix., 116.
Beech, adhesion in, x., *91.
Beech, heterophylly in, ix., 144.
Bees, action of toward Impatiens, vii., 90.
Bees and flowers, vii., 66.
Bees, perforating Gerardia, vii., 114.
Bees and colored flowers, xi., 50.
Berteroa incana, xi., 94.
Berzelius catalogue, additions to, x., 120.
Bibliographical Notes on well known plants, xiv., 136, 165, 177, 215, 225, 257; xv., 84, 110, 285.
Biddulphia ? ? n. sp., xvi , *208.
Biddulphia Brittoniana, n. sp., xvi., 73; *208.
Biddulphia Cookiana, n. sp., xvi., *73.
Biddulphia Woodmanii, n. sp., xvi., *74.
Bigelovia, n. sp., x., 126.
Blackberry, a white-fruited, viii, 129; ix., 24.
Boehmeria cylindrica, var. scabra, n. var., xvi., 21.
Boletus, n. sp., x., *73; xii., *33.
Bonpland, origin of the name, ix., 92.
Borraginaceæ, fertilization of, x., 83.
Botanical Club of A. A. A. S., xii , 73, 106; xiii., 169; xiv., 202.
Botanical Club North Jersey, vii., 33, 49.
Botanical Club, Syracuse, viii., 24, 60; ix . 36, 132, 156; x., 60, 124; xi , 47.
Botanical Club, Torrey, Field Meetings, vii., 73, 113.
Botanical Club, Torrey, Proceedings, vii., 1, 13, 25, 37, 49, 61, 73, 93 101, 113, 121; viii., 12, 24, 36, 48, 60, 84, 108, 132; ix., 12, 24, 60, 96, 119, 144, 155; x., 12, 36, 60, 108, 135; xi., 21, 36, 48, 59, 83, 139; xii., 32, 44, 56, 68, 124, 136; xiii., 16, 32, 48, 88, 104, 128, 226, 252; xiv., 24, 43, 67, 87, 107, 131, 153, 175, 199, 250, 265; xv., 26, 57, 95, 120, 149, 175, 204, 300, 327; xvi., 37, 59, 89, 123, 146, 178, 206, 313, 340.
Botanical Exchange, Announcement of the Committee on, xv., 139.
Botanical Exchange Club, xv., 49.
Botanical Exchange Club, Rules for the, xv., 167.
Botanical Literature, viii., 11, 21, 35, 48, 59, 71, 83, 94, 106, 130; ix., 57, 94, 108, 118, 132, 143;

155; x., 35, 72, 96, 134; xi., 11, 58, 72, 95, 137; xii., 11, 32, 43, 67, 79, 92, 123, 134.
Botanical Literature, index to recent American, xiii., 7, 29, 41, 63, 85, 95, 123, 146, 173, 192, 222, 247; xiv., 15, 35, 59, 77, 100, 126, 149, 167, 191, 219, 239, 259; xv., 20, 53, 90, 112, 143, 170, 199, 222, 239, 274, 295, 322; xvi., 30, 55, 84, 116, 139, 167, 199, 227, 252, 280, 305, 333.
Botanical News, vii., 21, 34, 57, 71, 83, 99, 119.
" Notes, viii., 8, 19, 116; ix., 92, 106, 117, 129, 141, 153; x., 10, 71, 83, 95, 108, 122, 133; xi., 10, 21, 33, 46, 56, 69, 80, 94, 105; xii., 10, 30, 41, 53, 63, 74, 87, 117, 131; xiii., 15, 31, 47, 67, 87, 100, 126, 151, 180, 195, 226, 252; xiv., 22, 41, 63, 83, 106, 130, 174, 197, 222, 247, 263; xv., 25, 119, 137, 169, 191, 218, 236, 300; xvi., 21, 55, 78, 112, 136, 161, 196, 225, 248, *266, 277, 330.
Botanical Notes from Kansas, xv., 218.
" " in Virginia and the Southern Alleghanies, xiii., 69.
Botanical reading done in the laboratory of Prof. Schwendener, Notes on, xvi., 297.
Botanical trip through North New Jersey, vii., 28.
Botanists of the A. A. A. S., a letter from Commissioner Colman to the, xiii., 228.
Botany at the Buffalo meeting of the A. A. A. S., xiii., 169.
Botany of the Aztecs, xii., 95.
Botany of Humboldt County, Cal., xvi., 147.
Botany, Shaw School of, xii., 118.
Botrychia, notes on, xi., 75.
Botrychia, vernation in, viii., 100.
Botrychium, abnormal, ix., 23, 100, 116.
Botrychium boreale, vernation in, vii., 115.
Botrychium simplex, new station, viii., 93.
Bouteloua gracilis, xi., 133.
Bouteloua, n. sp., xi., 5.
Boxwood, xii., 111.
Branches, rooting at tips of, viii., 44.
Branches, severed, absorption in, xi., 68.
Brasenia peltata, Pursh, Histology of the vegetative organs, xv., *29.
Brickellia, n. sp., x., 86.
Bromus Pumpellianus, Scrib., xv., *9.
Brunella, etymology of word, xii., 59.
Brunellia Oliverii, spec., nov., xvi., 160.
Bryological Notes, vii., 2, 15; xv., 185.
Bryology, American, contributions to, xvi., *107.
Bryology of Canada, contribution to, xvi., 91.
Bryum angustirete, n. sp., xvi., 95.
Bryum hydrophyllum, n. sp., xvi., 95.
Bryum meesioides, n. sp., xvi., 95.
Bryum Ontariense, n. sp., xvi., 96.
Bryum Vancouveriense, n. sp., xvi., 95.
Buchloe dactyloides, Engelm., xv., 215.
Buckley, S. B., death of, xi., 46.
Buettneria Benensis, spec. nov., xvi., 155.
Buettneria Boliviana, spec nov., xvi., 155.
Buettneria coriacea, spec. nov., xvi., 156.
Buettneria pescaprælfolia, spec. nov., xvi., 155.
Bumelia, n. sp., x., 90, 91.
Butterflies as botanists, xi., 82.
Buxbaumia aphylla, time of fruiting of, xiii., 244.
Cactus spines, use of, xii., 60.
Cæoma, n. sp., x., 62; xi., 50.
Calendula officinalis, xi., 136.
California, Notes from, vii., 97.
California, Lower, notes from, x., 106.
Californian plants, new, ix., 15, 31; xvi., 221.
Caliciopsis, new genus of fungi, ix., *62.
Calliandra Boliviana, spec. nov., xvi., 327.
Calloria, n. sp., x. 49.
Calocylindrus, n. sp., x., 16.
Calluna vulgaris, xiv., 11.
Calycanthus, The fruit of, xv., 205.
Cambium-layer, phenomena, ix., *137.
Camellia Japonica, note on the inflorescence of, xiv., 32.
Camptosorus, variations in, vii., 26, 85.
Capsicum fasciculatum, sp. nov., xv., 133.
Capsicum umbilicatum, Vellozo, xv., 108.
Cardamine, speciosa, spec. nov., xvi., 16.
Carex Deweyi, query concerning, ix., 35.
Carex, Pennsylvanica and C. varia, xi., 52.
Carex riparia, new variety of, ix., 151.
Carex Sullivantii at Yonkers, N. Y., vii., 38.
Carex umbellata, Schkuhr, xvi., 218.
Carices, artificial synopses of, vii., 88.
Carices, errors in descriptions, ix., 82.
Carices, notes on a few, viii., 77.
Carices, untenable names of, xi., 18.
Carrot, prolification in, ix., 151.
Carya, husk of, morphology, xi., 69.
Carya, tricotyledonous, vii., 21, *54.
Carya alba, tricotyledonous, vii., 21, *54.
Carya porcina, abnormal, xi., *33.
Castalia versus Nymphæa, xv., 51, 84.
Castanea, adhesion of involucres in, vii., 121.
Cau'ophyllum thalictroides, some morphological notes on, xiv., 139.
Caulophyllum thalictroides, note on the color of, xiv., 258.
Cell-formation, new illustration, viii., *10.
Cell-markings, xii., 132.
Celtis occidentalis, a large, xi., 93.
Cement for mounting plants, xi., 30.
Centaurea, motion of stamens in, x., 108.
Centaurea, proliferous, vii., 69.
Cenangium, n. sp., x., 76.
Cerastium arvense, L., and its North American varieties, xiv., *45.
Cerastium Texanum, n. sp., xv., 97.
Cercospora, n. sp., x., 50; xi., 115, 116, 121, 122.
Cereals, origin of, xii., 76.
Cereus, adhesion of joints in, vii., 101.

Cereus, cross-fertilization in, viii., 92.
Cereus nycticalus, fruit of, xi., 135.
Chara, development of cortex in, ix., *37.
Characeæ of America and Asia, similarity, vii., 105.
Characeæ, some notes on, xiv., *211.
Chellanthes Mexicana, n sp., xv., 227
Chellanthes myriophylla. viii, 116.
Chellanthes Pringlei n. sp , x., *61.
Chellanthes, vestita in N. Y., State, vii., 16.
Chellanthes vestita, Sw., on New York Island, xv., 211.
Chemung Co., N. Y., notes from, viii., 115; ix., 79.
Chemung Co., N. Y., notes on flora of, x., 8, 70.
Chestnut tree, a large, vii., 81.
Chlorophyll, ix., 141.
Chlorophyll, Pringsheim's researches on, vii., 23.
Chlorophyll, action of in lichens, vii., 83.
Chlorophyll in epidermis of leaves, viii., 20.
Choke-cherry, is the amber-colored entitled to a distinct name? xv., 267.
Chrysymenia pseudodichotoma, n. sp., xvi.,*1.
Cicero Swamp, N. Y., flora of, x., 66.
Cintractia, genus, xii , *69.
Classification of slight varieties, xvi , 328.
Cleistogamy, in Lamium, xii., 51.
Clematis viorna, new station for, x., 82.
Cliftonia nitida, Gærtn , xiv., 167.
Clinton, George W., death of, xii , 103.
Clover, abnormal growth in, viii., 113.
Clover, fertilization of, viii., 117.
Cocculus, polymorphous leaves in, x , 136.
Cohesion of glumes in Agrostis, viii., *78.
Cohesion and adhesion in Fuchsia, viii., 60.
Color as a distinguishing feature of certain plants, xvi., 268.
Colors of flowers, and altitude, viii., 8.
Comandra, haustoria of, x , *37.
Comandra umbellata, parasitism of vii., 67.
Compositæ, new species of, ix., 15, 109.
Compositæ, Western, new, x , 86.
Concentric annual growths, ix., 10.
Coniferæ, preservation of specimens, ix., 96.
Coniferæ of Washington Territory, x., 47.
Connecticut, plants new to, x., 102.
CONTRIBUTORS:
Allen, T. F.,vii., 105; ix , *37; x , *109; xiv., *211; xv., 11.
Ami, Henry M., xiv., 14; xv., 136.
Anderson, F. W., xvi., 217.
Arnold, Isabel S., xv., 133.
Arthur, J. C , xii., 52.
Austin, C. F., vii., 2, 15.
Bailey, L. H., Jr., viii, 47; ix, 24; xi, 17; xvi, 218, 328.
Bailey, W. W., vii, 19, 98, 116; viii, 71, 93, *128, 129; ix, 11, *50, 57, 90, 106, 114, 116, 129, 152; x, 75, *82, 122, 132, 134; xi, 9, 19, 55, 94, 119; xii, 10, 87; xiii, 61, 62, 101; xiv, 96; xvi, 23, 136, 329.
Baldwin, Henry, x, 58.
Banning, Mary E., ix, 125, 153.
Beal, W. J., ix, 89.
Beardslee, H. C , vii, 31, 54.
Beauchamp, W. M., xv, 214, 266; xvi, 54.
Bebb, M. S., xv, *121; xvi, 22, 39, *211.
Bessey, C. E., viii, *41, 126; ix, 11; xiv, 189, 202.
Best, G. N., xiii, 121, 245; xiv, 253; xvi, 161.
Bicknell, E. P., vii, 51, 55; viii, 76, 130; xi, 52; xii, 51; xvi, 51.
Bisby, Julius A., xiv, 13.
Blake, Joseph, viii., 48.
Boltwood, H. L., viii., 93, 144.
Brainerd, Ezra, viii., 6.
Britton, E. G., xiii, 7, 69, *95; xiv, 10, 96, 202; xv, 203, 220, 247, 268; xvi, 79, *107, 120, 141, 167, 196, 225, 250, 307, 331.
Britton, N. L., vii., 11, 18, 21, 48, 81, 108; viii, 7, 16, 81, 111, 114, 116, *126; ix, *13, 101, 149; x, 67, 82, 103, 105, 129, 133; xi, 9, 20, 29, 42, 45, 66, 76, 85, 117, 126; xii, 7, 11, 12, 26, 36, 40, 48, 98; xiii, 6, 41, 84. *89, 185, 205; xiv, 19, *45, 84, 114, 143, 149, 168, 187, 224; xv, 24, 90, 97, 139, 188, 273, 274, 277, 297, 298, 320, 323, 324, 325; xvi, 13, 56, 61, 83, 113 123, 125, 132, 153, 166, 171, 189, 196, 197, 202, 205, 246, 259, 272, 282, 284, 306, 311, 312, 335, 336, 337, 338, 340.
Brown, Addison, vii, 114, 122; viii, 81, 141.
Buckley, S. B., x, 90.
Burgess, T. J. W., xiv, 43.
Calkins, W. W., xvi, 330.
Campbell, D. H., x, *119; xii, *8; xiii, 49, 93; xv, 258, 262.
Canby, Wm. M., xiv, 67.
Chickering, J. W., Jr., ix, 140; xi, 116.
Clapp, Henry L., viii, 127; ix, 84.
Claypole, E. W., xiii, 187, 191.
Claypole, K. B., xiv, 258; xv, 190.
Cleveland, D., ix, 85.
Cockerell, T. D. A , xvi, 270.
Collins, F. S., vii, 117; ix, 69; x, 55; xi, 29, 130; xv, 309.
Cook, O. F., xiv, 89.
Cope, Mary S., ix, 12.
Coville, F. V.; xiii, 190.
Davenport, Geo. E., vii, 50, 85, 115; viii, 30, *61, 88, 100, 109, 116; ix, 20, 68, 71, 99, 108; x, 4, 41, *61; xii, 21; xiii, 81, 129; xv, 225.
Davis, G. P., x, 70.
Davis, W. T., xiii, 222.
Day, D. F., ix, 127; xi, 46; xvi, 285, 291.
Day, E. H., xiii, *62, 94.
Deane, Walter, xv, 59.
Drew, E. R., xvi, 147.

Dudley, P. H., xiii, 91, 122.
Dudley, W. R., x, *1.
Eaton, D. C., vii, 62, 83; viii, 4, 99, 107, 111; ix, 49, 57; x, 26, 101, 102; xi, 67; xiv, 97; xv, 173.
Eckfeldt, J. W., xv, 184; xvi, 104.
Ellis, J. B., vii, 90; viii, 27, 29, 51, 64, 73, 89, 123; ix, 18, 73, 98, 111, 118, 133; x, 52, 76, 89, 96, 97, 117; xi, 18, 41, 73, 114, 120, 121.
Engelmann, George, ix, 4, 127.
Everhart, B. M., x, 76, 89, 97, 117; xi., 18, 41, 73.
Fairchild, H. L., viii., 62.
Farlow, W. G., viii, 67, 85; ix., 65; xii., 41; xv., 183, 184; xvi., *1.
Foerste, Aug F., x., 33; xi., *31, *62, 102, 119, *123; xiii., *39; xiv., *74, 139; xv., *151; xvi., *266.
Gerard, W. R., vii., 8, 17, 29, 30, 56, 67, 108, 118; viii., 7, 14, 16, 33, 81, 105; x., 67, 103, 129; xi., 9, 42; xii., 26, 29, 36, 37, 57, 72, 84, 98, 102.
Gilbert, B. D., xi., 75.
Gillett, Edward, xi., 9.
Gratacap, L. P., x., 79; xi, 68; xiii., 188.
Gray, Asa, ix., 73, 152; x., 94; xi., 76; xii., 102; xiii, 1, 101; xiv., 228.
Greene, Edward L., viii., 5, 25, 97, 121; ix., 15, 62, 109, 121, 145; x., 41, 86, 125; xiii., 61, 141, 216; xiv., 116, 136, 165, 177, 215, 225, 257; xv., 84, 110, 125, 285.
Gregory, Emily L., xiii., *197, *233; xv., 89, 143, 198, 238, 271; xvi., 25, 28, 79, 80, 82, 118, 222, 224, 252, 279, 297, 332.
Gross, C. A., xi., 32.
Guttenburg, J., vi., 19.
Guttenburg, G., viii., 28.
Haberer, J. V., ix., 33.
Halsted, Byron, D., xiv., *121; xv., 84, 139 *213; xvi., 130, 135, 166.
Hapgood, Bell F., xi., 117.
Harkness, H. W., viii., 97, 51.
Hart, J., xii, 72; xiii., 101.
Harvey, F. L., x., 133; xi., 33; xv., 155; xvi., 181.
Havard, Dr. Valery, xv., 215.
Hervey, A. B, ix., 120, 126; x., 57.
Hill, E. J., viii., 45; x., 93.
Hitchcock, A. S., xvi., 69.
Hogg, Thos., ix., 85.
Holden, Isaac, xiv., 97, 149.
Hollick, C. A., vii., 11, 14; viii., 48, 144; ix., 12, *129, 149; xii., 40; xiii., 84; xiv., *45; xv., 219, 245, *303; xvi., 30, 55, 84, 116, 132, 129, 167, 170, 177, 199, 227, 252, 280, 305.
Horner, Mrs. C. N. S., xi., 8; xiv., 218.
Howe, E. C, viii., 77, 93; ix., 35, 82, 90.
Jackson, Joseph, xvi., 137.
James, Jos. F., x., 56, 57, 82; xiv., 223; xv., 20, 52, 314; xvi., 268.
Jesup, H. G, x., 62.
Johnson, L. N., xvi., 263, 330.
Jones, M. E., viii., 70, 75; ix., 5, 31, 91, 92, 116, 124, 128; x, 32, 69.
Kain, C. Henry, xiv., 25, 57, 78, 131, 141, 172, 174; xv., 119, 128, 183, 220; xvi., 32, 33, 57, *71, *207.
Kellerman, W. A., xi., 114, 121.
Kemp, J. F., xii., 45.
Kleeberger, Geo. R., vii., 97.
Knight, Elizabeth G., viii., 125; x., 84, *99; xi., 116, 134.
Kunze, R. E., x., 78; xi., 135.
Lawson, George, xi., 132; xiv., 12.
Leggett, W. H., vii., 57; viii., *108, 115.
Lemmon, J. G., x., 133; xvi., 221.
Lesquereux, Leo, vii., 38.
Lighthipe, L. H., xiii., 4.
Lockwood, Samuel, viii., 44, 53; ix, 152; xi., 45, 87, 136.
Lucy, T. F., viii., 115; ix., 72; x., 8, 70.
Lown, Clarence, vii., 96.
Lyon, Florence May, xiv., *180.
Macloskie, Geo., vii., 56; xi., 8.
Macoun, John xv., 185; xvi., 91.
Massey, W. F., xv., 193.
Mears, Ellis, viii., 71, 130.
Meehan, Thomas, vii., 20, 66, 105; viii., 80; 113; ix., 10, 11, 55, 82, 151; x., 24, 118, 119, 132; xi., 50, 53, 94, 119; xii., 29, 60, 62, 81, 83, 86, 116; xiv., 58, 59, 218, 238; xv., 137, 192, 193, 219, 267, 316; xvi., 24, 49, 68, 293.
Mellichamp, J. H., viii., 47, *112, ix., 115, 128.
Merriam, C. H., x., 93; xi., 66.
Merrill, F. J. H, xiii., 6.
Miller, E. S, vii., 16, 17; x., 121; xi., 136; xii., 63, 87, 116; xiv., 131.
Millington, Lucy A., x., 24.
Millspaugh, C. F. xi., 55, 133; xii., 109; xiv., 188; xvi., 65, 136.
Morong, Thomas, xiii., 145, *153; xiv., 51; xv., *1, *73, 139; xvi., 43, 273.
Morris, D., xii, 72.
Nealley, G. C., xiii., 247.
Newberry, J. S., vii, 74; xii., 50; xiii, 33, *77, 183; xiv., *1.
Northrop, J. I., xiv., 230; xvi., 164, *165.
Orcutt, C. R., x., 81, 106; xi., 67; xii., 62, 117.
Owen, Maria L., xi, 117.
Oyster, J. H., xi., 30, 104; xiv., 223; xv., 214.
Pammel, L. H., xiii., *17.
Parry, C. C., ix., *30, 97; x., 23, *50; xvi., 277.
Peck, Chas. H., vii., 102; viii., *49; ix., *1, *61, *123; x., 62., *73, 127; xi., 26,49.

Peirce, Mary F., xiv., 229.
Perkins, George H., xv., 220.
Perry, Geo. W., x., 106; xi., 93.
Peters, John E., xii., 62.
Pike, Nicholas, xiii., 105.
Plowright, C. B., xi., 32, 64, 93; xiii., 127.
Porter, Thomas C., viii., 91, 129, xi., 90; xiv., 8; xvi., 21, 24, 53, 67, 220, 277.
Post, Geo. E., vii., 66.
Prentiss, A. N., viii., 104; ix., 8; x., 43.
Rand, Edw. L., xvi., 294.
Rau, E. A., viii., 114; ix., 105; xiii., 120.
Ravenel, H. W., viii., 87; ix., 23, 112, 128, 140; x., *54; xi., 132.
Redfield, J. H., viii., 42, 80, 105, 112; xi., 97, 104; xii., 93, 103; xiii., 220, 232, 245; xvi., 193, 295.
Reynolds, Mary C., vii., 89.
Rich, Alice B., xvi., 112.
Ridgway, R., viii., 6; x., 121.
Robinson, John, viii., 83, 93; xv., 166.
Roth, Filibert, xv., 292.
Rudkin, W. H., vii., 81, 107; x., 95.
Rusby, H. H., vii., 28; viii., 59, 92, 93; ix., 53, 78, 106; xi., 88, 128; xii., *16; xiv., 42, 83, 125; xv., 28, 177, 194, 199, 219, 237, 247; xvi., 33, 35, 37, 55, 205, 227.
Rust, Mary O., ix., 6, 17, 37; x., 66, 121.
Safford, W. E., xiii., 114, 244; xiv., 144, 159; xv., 15, 105, 210.
Sargent, C. S., xii., 10; xiii., 78.
Sargent, F. Le Roy, xiv., 63.
Schaarschmidt, Jules, xi., 101; xii., 51.
Schrenk, Jos., vii., 67; viii., 32; ix., *47, *83, 90; x., *37, 132; xi., *1, *93, *109; xii., *13; xiii., 38, 68, 169; xiv., 14, 53, 77; xv., *29, 119, 273, 293; xvi., *315.
Schuh, R. E., xvi., 137.
Schultze, E. A., xiv., *69, *96, *109; xvi., *71, *98, *165, *207.
Scribner, F. L., viii., 35, 59, *78; ix., 32, 34, 52, 56, 74, 86, 103, 134, 145, 153; x., 7, 29, 35, *63, *77, *85; xi., 5, 45, 133; xiii., 181; xv., 8; xvi., 233.
Seaman, Wm. H., xiii., 145.
Seymour, A. B., xiv., 193.
Slosson, Annie T., xi., 118, 120.
Smith, Chas. E., ix., 83; xiv., 34.
Smith, J. Donnell, vii., 64, 118, 126; xv., 165.
Sterns, E. E., xiv., 32, 192; xv., 15, 52, 86, 111, 112, 162, 167, 190, 205, 211, 230, 236, 317, 322; xvi., 21, 77.
Stone, W. E., ix., 56, 84; x., 9, 48, 107; xi., 65; xii., 82.
Stowell, Willard A., xiv., 76.
Sturtevant, E. Lewis, xv., 109, 134; xvi., 21.
Taylor, Geo. H., xiv., 141.
Tillinghast, Frank N., xiv., 59.
Tracy, C. T., ix., 84.
Trelease, William, vii., 20, 97; viii., 13, 68, *133; ix., *102; xii., *69; xiii., 135.
Trimble, Wm., x., 10, 140.
Trumbull, Annie S., x., 34.
Tuckerman, Edward, viii., 66; ix., 143; x., 21, 42; xi., 25.
Tweedy, F., vii., 19, 26, 56; ix., 23; x., 47; xii., 24.
Underwood, Lucien M., vii., 86; viii., 78, 101; xi., 7; xiv., 89; xvi., 138.
Urban, Ignatius, xiv., 106.
Vasey, George, x., 21, *25, 32, 42, 52, *128; xi., 7, *37, 61, 125; xii., 6; xiii., 25, 29, 52, 118, 162, *219, 229; xiv., 8, 94, 98, 103, *133, 203; xv., 11, 48, 117, 139, 168, 294, 295.
Vroom, J., ix., 92; xi., 116; xiv., 12.
Ward, L. F., xi., 92.
Watson, Sereno, xiv., 155, 167; xv., 139, 191.
Wheeler, E. S., vii., 98.
Wibbe, J. H., x., 46; xiii., 39.
Wilber, G. M., viii., 129; xii., 87.
Willey, H., viii., 6, 47, 140, 144; ix., 6, 33, 57, 152; xii., 61, 113; xiv., 134, 247; xv., 114, 147; xvi., 198.
Williamson, John, vii., 80, 94.
Willis, O. R., viii., 53, 79, 127, 128; ix., 8; xiii., 246; xvi., 278.
Winter, George, x., 7, 50.
Wolcott, H. L. T., xv., 268.
Wolle, Francis, vii., 43, 91; viii., *1, 37; ix., *25; x., *13; xi., *3; xii., *1, *125; xiii., 56.
Wood, T. F., ix., 115.
Wright, Charles, x., 101.
Wright, S. H., ix., 86, 151; xi, 46; xiv., 135.

Convolvulus, petalody of stamens in, vii., 128.
Coprinus, unusual habitat, viii., 67.
Corema Conradii, new station for, ix., 83.
Corema Conradii, notes on, xi., 97, 116, 122; xii., 10, 93; xiv., 11.
Corema localities, still further notes upon, xiii., 220.
Corema in New Jersey, xvi., 193.
Corema, with Pinus Banksiana on the coast of Maine, xvi., 295.
Corethrogyne, n. sp., x., 41.
Cornus, a large, vii., 121.
Cornus, pleiotaxy of bracts in, vii., 1.
Corona of the Narcissus, ix., 106.
Corydalis, etymology of word, xii., 59.
Corydalis sempervirens, Wave-growth of, xvi., 293.
Corynites Curtisii, B., Development of, xv., *314.
Cosmarium, n. sp., x., 16, 17; xii., 2.
Cotyledon, n. sp., x., 125.
Coursetia Boliviana, spec. nov., xvi., 260.
Cowania Havardi, xii., 56.

Crantzia lineata, xii , 87.
Cremalobus Bolivianus, spec. nov., xvi., 17.
Cross-fertilization in Cereus, viii., 92.
Crotalaria pods, elasticity of, vii., 20.
Croton monanthogynum, sexuality of vii , 105.
Crucifer, a new Mexican, ix., 124.
Cruciferæ, nectar glands of, xii , 10.
Cryptogamia versus Heterophyta, xv , 111.
Cryptoporus, new subgenus of Fungi, vii., 104.
Cucurbita, the fruits of, ix., *30.
Cucurbita Californica, x., *50.
Cucurbitaria, n. sp., x., 53, 89.
Cynosurus cristatus, note on, viii , 35.
Cyperaceæ, a list of, xi., 85.
Cyperaceæ, a new genus in, xiv., 135.
Cyperi, preliminary list of North American species of, xiii., 205.
Cyperus, n. sp.. xi., 29, 86; xii., 7.
Cyperus echinatus (Ell.), Britton, xv., 99.
Cyperus humilis, Kunth, var. elatior, n. var., xv., 99.
Cyperus Martindalei, n. sp., xv., 98.
Cyperus ovularis, and C. cylindricus, vii., *48.
Cyperus refractus, note on, x., 32.
Cypripedium, monstrous, viii., 117.
Cypripedium, spiked, xii., 28, 54.
Daisy, ox-eye, abnormal, xi., 67.
Dalea Bolliviana, spec. nov., xvi., 259.
Dandelion, adventitious leaf on, ix., 11, 129.
Danthonia, n. sp., x., 52
Darlington, unpublished letter of, viii., 142.
DeCandolle's "Cultivated Plants," On some inaccuracies in, xv., 196.
Delaware, floras of, viii , 83.
Dendrodochium, n. sp., xi., 50.
Dendrological Notes, xiii., 78.
Dendrometer, a simple, viii., *41.
Desmids, new species of, vii., 44, *91; viii., *1; xii , *1, 51, *125, 133.
Desmids of the United States, Turner's new, xiii., 56.
Desmodium Mandoni, spec. nov., xv , 261.
Desmodium Yungasense, spec. nov., xvi., 261.
Deyeuxia, n. sp., x., *64.
Deyeuxia Suksdorfii, Scrib., xv., *19.
Diaporthe, n. sp., x., 49, 89, 98.
Diatomaceæ, new fossil deposits of, xiv., 57.
Diatomaceæ of Shark River, N. J., xiv., 99.
Diatoms, notes on, xiv. 25, 57, 78, 131, 141, 171, 172, 174, 247.
Diatoms of Atlantic City and Vicinity, xv., 128.
Diatoms, a descriptive list of Staten Island, xiv., *69, *109; xvi., *98.
Diatomaceous deposit, from Atlantic City, Fossil Marine, xvi., *71, *207.
Dicentra Canadensis, tubers of, ix., 90.
Dicentra Cucullaria, rootstock of, ix., *47.
Dicentra, note on, xi., 55.
Dicentra punctured by bees, xi., 66.
Dichelyma longinerve, n. sp., xvi., 97.
Dichromena, a new species of, ix., 86.
Dichromena Watsoni, n. sp., xv., 101.
Dickie, Dr. G., death of, ix., 120.
Dicotyledon, a locomotive, viii., 116.
Dicotyledons, nomenclature of leaves of fossil, xiii., 38.
Dicranella parvula, n. sp., xvi., 91.
Dicranum leioneuron, n. sp., xvi , 92.
Dicranum scoparium, var. scopariforme, n. var., xvi., 92.
Dicranum stenodictyon, n. sp., xvi., 92.
Dictyosiphon Macounii, n. sp., xvi., *11.
Dictyosphærium, n. sp , xii., 126.
Dimeregramma Novæ-Cæsareæ, n. sp., xvi., *74.
Dioclea Boykinii, new station for, x., 133.
Diospyros Kaki, economic use of, x., 95.
Diplachne, n. sp., x., 30.
Disporum, Salisb. The genus, xv., 187.
Distribution of the Buffalo Grass, xv., 215.
Dodecatheon, development of, xi., *31.
Donnellia, new genus of Muscl, vii , 15.
Draba Crockeri, n sp., xvi., 221.
Draba, n. sp., x., 125.
Draba verna, biennial, vii., 21.
Droseraceæ of Spruce Pond, xi., 133.
Dry rot, xii., 92.
Drying plants with little loss of color, a method of, xiv., *33.
Duct formation in chestnut wood, xiii., 91.
Duguetia glabra, spec. nov., xvi., 14.
Echinocystis and Echinopepon, xiv., 155.
Echinospermum Greenei, ix., 128.
Ectocarpus, n. sp., xii., 125.
Ectocarpus tomentosoides, n. sp., xvi., *11.
Elastic stamens in Compositæ, xvi., 68.
Electric light, influence on vegetation, vii., 59.
Electricity, influence on plant growth, vii., 37.
Electric phenomena in plants, ix., 142.
Eleocharis nodulosa, note on, ix., 56.
Eleocharis, n. sp., x., 101.
Elm, change in leaves of, xii., 87.
Elymus, proliferous, x., 9.
Elymus, n. sp., xi., 126.
Encelia, n. sp , x., 41.
Engelmann, George, xi., 20, *38.
Engelmann, Dr., tribute to, xii., 55.
Epigæa repens, late flowering, ix., 12.
Epilobium palustre, bulbs of, x., 24.
Epilobium exaltatum, n. sp., xvi., 151.
Epipactis Helleborine, new station, ix., 127.
Erica and Calluna on Nantucket, xiii., 246.
Erica cinerea, xiv., 11.
Ericaceæ, anthesis in, xii., *16.
Erigeron, fasciation in, vii., 68.
Eriogonum speciosum, n. sp., xvi., 152.
Eryngium Ludovicianum, n. sp., xiv., 51.
Erythronium albidum, Nutt., var. coloratum, n. var., xv., 111.

Erythroxylon Coca, the lateral lines in the leaf of, xiv., 125.
Euastrum, n. sp., xi , 18; xii , 3, 4.
Eucalypti, new use for, xii., 65.
Eunotia Americana, n. sp., xvi., *209.
Euphorbia Montereyana, sp. nov., xvi., 66.
Euphorbia occidentalis, n. sp., xvi., 152.
Euphorbia radicloides, var. rubra, n. var., xvi., 65.
Euphorbiaceæ Mexicanæ, xvi., 65
Euphrasia officinalis, xiii., 232; xiv., 10, 12, 58.
Eustichium Norvegicum, fruit of, x., *99.
Evolutionist, a forgotten, ix., 93.
Excipula, n. sp., xi., 73.
Exogens, growth of, viii., 127; ix., 8.
Fasciation in Amorpha, x., 136.
" in Compositae, viii., 93.
" in Linaria, ix., 141.
" note on, viii., 93.
" in Ranunculus, ix., 10.
" in Rondeletia, viii., 71.
" in Taraxacum, ix., 10.
" in Rubus, x., 48.
Fendlera, genus, emendation of, viii., 25.
Fern, a new American, viii., *61.
" a new (Notholaena), vii., *50.
" apospory in, xii., 42.
" collected in Mexico and Chihuahua, by C. G. Pringle, 1886-1887, List of xv., 325
" development of the antheridia in, xiii., *49.
" distribution of in U. S., x., 58.
" Fendler's Trinidad, vii., 96.
" filmy of Jamaica, xii., 117.
" Florida, Curtiss's, vii., 94.
" Florida, another, xii., 67; xiv., 149.
" notes, viii., 88; x., 4; xii., 21; xiii., 81. *129; xv., 225.
" notes on, ix., 20, 68, 91, 99, *129.
" notes on some Florida, xiv., 97.
" notes on variations of, vii , 85.
" of New Mexico, Rusby's, viii., 36.
" of New York State, viii., 78.
" of the U. S., new or little known, vii , 62; viii., 4, 99, 111; ix., 49; x., 26, 101,
" on the Cumberland, vii , 94.
" prothallia, development of, x., *119.
" rust, new, x., 69.
" Sporangia, the dehiscence of, xiii., 168.
" variations in, vii., 60.
Fertilization of Arenaria, xii., 62.
" " Clover, viii., 117.
" " Rhexia, viii., *102.
" " Scrophularia, viii., *133.
" cross, in Cereus, viii., 92.
Festuca, n. sp., xi., 1, 196.
Ficus, ferment of xii., 90.
Field for a Collector, An inviting, xv., 210.
Field Meetings of N. Jersey Bot. Club, vii., 49.
Field Meetings of the Torrey Club, vii., 73, 113.
Fig trees, notes on behavior of, vii., 66.
Filices, fission of rachis in, vii., 26, 85, 79.
Fimbristylis capillaris, var. coarctata, xv., 102.
Fimbristylis capillaris, var. pilosa, n. var., xv., 102.
Fir leaf wool, xii., 66.
Fishberries, xi., 11.
Fish killed by Utricularia, xi., 82.
Fission of pedicel in Convallaria, ix., 120.
Fission of scape in Dicentra, viii., 84.
Flora, Adirondacks, notes on, x., 43.
" Amboy clays, fossil, xiii., 53.
" Banda Oriental, xiv., 144, 159.
" Bermuda, xii., 45.
" Broome County, xii., 100.
" Canadian, ix., 140.
" Carboniferous, vii., 75.
" Cayuta Creek, notes on the, xiv., 183.
" Chemung County, N. Y., viii., 115.
" Chenango County, xii., 52.
" Country along Rio Grande, x., 122.
" Cretaceous, vii., 77.
" Fossil, Rocky Mt., xii., 91.
" Franconia Mountains, x., 34.
" Hudson Highlands, notes on, xiii., 60.
" Iowa, additions to, xvi., 69.
" Jurassic, vii., 76.
" Kittatinny Mts., xi., 126; xiv., 187.
" Middlesex County, N. J., viii., 7.
" Native, additions to, xvi., 21.
" New Jersey, Northern, vii., 114.
" New Jersey, notes on, xiii., 4.
" New Jersey, Western, vii., 28.
" Newport, R. I., notes on, ix , 23.
" New York City, vii , 51, 114.
" North American, Geolog. Hist. of, vii. 73.
" Northampton County, Pa., viii., 114.
" Palisades of the Hudson, xvi., 51.
" Plainfield, N. J , vii., 26.
" Presque Isle, vii., 18; viii., 28.
" Pine Barrens, vii., 81.
" Rhode Island, vii., 98.
" Richmond County, N. Y., viii., 48; ix., 149; xii., 38; xiii., 83; xvi., 132.
" Ross County, Ohio, xiii., 114.
" Silurian, vii., 74.
" Suffolk County, vii., 17.
" Temiscouatensis, xv., 134.
" Tertiary, vii., 78.
" Triassic, vii., 76.
" Upper Chemung Valley, notes on, xv., 131.
" U. S. additions to, ix., 4.
" Utah and Nevada, notes on, ix., 5.
" Westchester County, N. Y., additions to, xiii., 6, 94.
" White Mts., notes on, ix., 114.

Flora, Wyoming and Colorado, ix., 156.
" Yellowstone Park, xii., 24.
Floras, a meeting-place for two, xiv , 189.
" insular, xiii., 245.
" local, ix., 107.
" local, of U. S., lists of, vii., 108; viii., 7, 16, 81; ix , 80; x , 67, 103, 129; xi., 9, 43; xii., 26, 36, 98.
Flowering of plants in autumn, viii., 129.
Flowers, abnormal, x., 71.
" Alpine, fertilization, viii., 113.
" and bees, vii., 66.
" colors of, vii., 71, 120; viii., 8; ix., 117.
" coloring matter of, xi., 21; xii., 89.
" cross-fertilization by insects, ix., 131.
" double, vii., 128.
" early of spring of 1880, vii., 25.
" of Menyanthes, dimorphous, ix., 92.
" mutilation of by bees, xi., 65.
" origin, through insect selection, vii., 99.
" perforation of, notes on, viii., 68.
" purple in Sagittaria, vii., 28.
" sexes of, relation of heat to, x., 71.
Foliage, autumn, viii., 107.
Fools-parsley not poisonous, viii., 9.
Forestry statistics, xii., 117.
Fraxinus with hypertrophied pedicels, vii., 113.
Freziera inæquilatera, spec. nov., xvi , 63.
Frond, what is a ? viii., 7.
Frost, Charles C , vii., 72.
Fruits and seeds, influence of crossing on, xi., 119.
Fruits, coloring matter of, xii , 89.
" of Cucurbita, ix , *30.
Frullania, n. sp., x , 132.
Fuchsia, monstrous flowers in, ix., *102.
" with adventive leaf, etc., vii., 84, 98.
Fungi, classification of, xii., 87.
" curious in Nevada mines, viii., 19.
" expansive power of, ix , 129.
" from New Mexico, viii., 34.
" in wrong genera, ix., *1.
" new, vii., *8, 90.
" new genus of, x., 127.
" new species of, x., 7, 49, 52, 62, *73, 76, 89, 97, 117; xii., *33.
" North American, new species, viii., 26, 34, *49, 51, 64, 73, 89, 123; ix , 18, *61, 73, 98, 111, 133; xi., 17, 26, 41, 49, 73, 114, 121.
" preservation of, viii., 14, 21, 27, 32, 56.
" preservative for, ix., 153.
Fungus, fossil, xii , 64.
" mimicry in a, xii., *29.
Galactia montana, sp. nov , xvi., 324.
Garden, Michaux's, xi., 88.
Gardens, Kew, director, new, xi , 132.
Gaylussacia resinosa, var. leucocarpa, n. var., xvi., 21.
Generic names, notes on, xii., 57.
Genista, pilosity in, vii., 120.
Gentiana alba, xvi , 53.
Geological formations and plant distribution, vii., 14.
Geological history of N. American flora, vii., 73.
Gerardia, haustoria of, xi., *109.
" tenuifolia, parasitic, x., 132.
Geum album, var. flavum, n. var., xvi., 21.
Gilia, new species of, viii., 70.
Ginkgo, the name, xii., 79.
Gleditschia inermis, Mill , xv., 110.
Gloeosiphonia verticillaris, n. sp , xvi., *8.
Glonium, n. sp., x., 76.
Glyceria, n. sp , x , *77.
Gnomonia, n. sp., x., 98.
Gonatobotrys, n. sp., x., 7.
Gourd seeds, vitality of, vii., 102.
Gramineæ, floral envelopes of, xii., 55.
" on two species, xv., 293.
Grape-vine, a large, viii., 116; ix., 11, 23; xi., 132.
Graphis abaphoides, spec. nov., xvi., 105.
Grass, a viviparous, vii., *118.
" an adventive, viii., 129.
" change of name in, ix., 32.
" new to California, viii., 59.
" New Western, xv., 11.
Grasses, a new genus of, xiii., *219.
" collected by Mr. Pringle, x., 8, 29.
" from Washington Territory, x., *63, *77.
" new American, xiii., 25, 52, 118.
" n. sp , x., 21, 29, 42, 52, *128; xi., 5, 7, *37, 61, 125; xii., 6; xiv., 94.
" new species of Mexican, xiii., 229; xiv., 8.
" new or little known, xv., *8.
" new or rare, xv., 48.
" North American genera of, ix., 134.
" notes on, ix., 153; x., 71; xi., 45.
" notes on some rare, xv., 294.
" of Arizona and California, ix., 74, 86, 103, 145.
" of North America, Scribner's, viii., 59.
" of Oregon, note on, ix., 34.
" special uses and properties of some Mexican, xiv., 98.
Gratiola, prolification in, ix., 139.
" pleiotaxy of corolla in, vii., 98.
Gray, Dr., birthday of, xii., *116.
" portrait of, xii., *72.
Grimmia arcuatifolia, n. sp., xvi , 93.
Gum, formation of, xi., 33.
Gum in wood, formation, xii., 55, 119.

Gum, Sonora, xii., 119.
Gyalecta lamprospora, xii., 61.
Gymnocladus, a fly-poison, ix., 130.
Gymnosporangia, notes on, viii., 85.
Habenaria ciliaris, flowering of, vii., 93.
Hairs of plants, vii., 71.
Haplaria, n. sp., x., 97.
Haustoria of Comandra, x., *37.
" " Gerardia, xi., *109.
Heleocharis, n. sp., xi., 87.
Helicteres Rusbyi, spec. nov., xvi., 154.
Helonias bullata in New Jersey, viii., 91.
" " new station for, ix., 101.
" " in cultivation, xi, 9.
Helotium, n. sp, x., 98.
Hemizonia, n. sp, x., 41; xvi, 151.
Hendersonia, n. sp., xi., 73.
Hepaticas, abnormal, xi., 55.
Hepatica, petalody of stamens in vii., 97.
Heppia omphaliza, spec. nov. xvi., 106.
Herbaria and libraries of the U. S., vii., 116.
" origin of, xi., 129.
" value of, vii., 126.
" Lapham, viii., 62.
" Muhlenberg, viii, 80.
" Olneyanum, vii, 116.
" Schimper's, sale of, vii., 84.
" of Cornell University, viii., 104.
" of Mass. Horticult Soc., viii., 30.
" of Phila. Acad. Nat. Sciences, viii., 42.
Hesperochiron nanus, xv., 110.
Heterocentron roseum, note on, ix., 11.
Heterophylly, Clematis, viii., 108.
" in Desmodium, viii., 12.
" in Fagus, x., 144.
" in Hepatica, viii., *36.
Hexagonia, n. sp., x., 73.
Hicoria of Rafinesque, the genus, xv, 277.
Hieracium aurantiacum, note on, viii., 112; ix., 12.
Histological investigation, xii., 63.
Holozonia, new genus, ix., 122.
" filipes, note on, ix., 145.
Hooker, Sir J. D,, retirement of, xii., 121.
Horsechestnut, synspermy in, xi., 119.
Hosackia denticulata, n. sp., xvi., 151.
Hough, Franklin B., death of, xii., 74.
Humulus, etymology of word, xii., 29.
Hydrocotyle Americana, tuberiferous, xiii., 28.
Hypnum hæmatidens, n. sp., xvi, 97.
" Leibergii, n. sp., xvi., 111.
Hypomyces, n. sp., xi., 28.
Idaho plants, viii., 81.
Ilex opaca with entire leaves, viii., *112.
" opaca, note on, viii., 128.
" a yellow-berried, ix., 152.
" Dahoon, yellow-berried, var., xi., 136.
" versicolor, germination of, ix., *83.
Impatiens, cleistogenous, x., 119.
Impatiens, fulva, action of bees toward, vii., 20.
Indian names of plants, Onondaga, xv., 262.
Insect selection, origin of flowers by, vii., 99.
Insects attracted by Phallus, xi., 70.
Introduced plants in Eastern Massachusetts, xiv., 219.
Involucre in Malvaceæ, xi., 8.
Iowa Flora, additions to, xvi., 69.
Ipomœa, tricotyledonous, x., *82.
Iris, albinism in, xi., 128.
" tetramerous, vii., 73.
Isaria, n. sp, xi., 115.
Juncus, proliferous, x., 9.
" Greenii, southern range of, xiii., 5.
" maritimus, note on, vii., 18.
" setaceus, note on, vii., 36.
" trifidus, notes on, xi., 20.
Kalmia as a tonic, xii., 53, 72.
Kansas fungi, xi., 114, 121.
" notes from, xi., 104; xii., 62.
Labiatæ, on gyno-dicecious, xvi., 49.
Laelia, peloric, vii., 84.
Lagophylla, n. sp., x., 86.
Laminaria, a new to the U. S., vii., 117.
" note on, viii., 67.
Lamium, cleistogamy in, xii., 51.
Leaf-forms, design of some, ix., 34.
Leaves, aromatic, in Quercus, xi., 117.
" autumn, color of, xii., 30.
" dimorphic, of aquatic plants, ix., 141.
" epidermis, chlorophyll in, viii., 20.
" forms of, x., 78.
" peculiar, in Quercus, viii., *126.
" photepinasty of, x., 84.
" sizes of, vii., 71.
Lechea and Polygala, note on, viii., 115.
Lechuguilla, the, xii , 120.
Lecidea, n. sp., xi., 21, 22.
" Floridensis, spec. nov , xvi., 104.
Leggett, William Henry, ix., 85.
Leguminosæ, calcium in, xii., 118.
Leontodon, abundance in Eastern States, vii., 114.
Leontodon, virescence in, viii., *128.
Lepidodendron, recent determination, viii., 62.
Leptochloa, n. sp., xii, 7.
Leptosphæria, n. sp., x., 53; xi., 42.
Leptozosma, n. gen., xii , 133.
Leskea nigrescens, n. sp., xvi., 97.
Leucanthemum vulgare var. tubuliflorum, vii , 17.
Libraries, botanical, and Herbaria of the U. S., vii.., 116.
Libriform tissue, the pores of, xiii., *197, *233.
Lichen, a new North American, viii., 140.
" note on a new North American, xiv., 134.
Lichens, action of chlorophyll in, vii., 83.

Lichens, apothecia of, xii., 88.
" new species of, xii., 61, 113.
" or fungi, viii., 66.
" of Africa and America, similarity, viii., 6.
" reproductive organs of, x., 84.
" some new North American, xvi., 104.
" theory of, ix., 33.
" two, of Pacific coast, xi., 25
" Western, new, x., 21, 42.
Lignin, a new reagent for, xiv., 14.
Lilium, deforming pilosity in, vii., 120.
" pentamerous, vii., 83.
" spiral torsion in, vii., 97.
" superbum, xii., 87.
" synanthy in, vii., 97.
Lily, an electrified, ix., 153.
Limnanthemum, notes on, xii., *13.
" submersed leaves in, x., 34.
Linnæa borealis, L., xiv., 136.
Linnæus and his Genera of Plants, xv., 125.
Liquidambar, elongation of the inflorescence in, xiv., 95.
Liriodendron simplex, n. sp., (fossil) xiv., *6.
" oblongifolium, n. sp., (fossil), xiv., *5.
" quercifolium, n. sp., (fossil), xiv., *6.
Listera australis, viii., 122.
Literature, botanical, xi., 11, 58, 72, 95, 137.
Lonicera grata, note on, x., 94.
Lophiostoma, n. sp., x., 52, 89.
Loranthus, a locomotive, viii., 117.
Lotus, Egyptian, xii., 65.
Lupinus adsurgens, n. sp., xvi., 150.
" sylvestris, n. sp., xvi., 150.
Lycopodiaceæ, history of, xii., 43.
Lycopodium, spores of, xii., 55.
" lucidulum, Bulblets on, xvi., 320.
Lythrum, etymology of word, xii., 60.
Magnolia glauca on Long Island, x., 95.
" " station, xii., 87.
Maine, floras of, viii., 8.
Malvaceæ, involucre in, xi., 8.
Malvastrum angustum in Ill., viii., 144.
" Rusbyi, spec. nov., xvi., 64.
Mandioca, xvi., 273.
Marsilia quadrifolia in Mass., viii., 127.
" " note on, viii., 144; xiii., 144.
" notes on the American species of, xiv., 89.
" vestita, var. tenuifolia, n. var., xiv., 92.
Marsiliaceæ, xv., 259.
Maryland, floras of, viii., 83.
Massachusetts, floras of, viii., 8.
Massachusetts, notes from, ix., 56, 84; xi., 8.
May-apple, notes on, xi., *62, 119.
Mayflower, the name, ix., 92.
Mayflower, the, xi., 105.
Medicinal Plants, Notes on, xv., 138.
Megalophyllosis, xii., 90.
Megarrhiza, xiv., 155.
Meiophylly in Fuchsia, ix., *102.
" " Lysimachia, viii., 60.
" " Urgenea, ix., 103.
Melanconis, n. sp., x., 117, 118.
Melanconium, n. sp., x., 74.
Melanthium latifolium, note on, x., 133.
Mentzelia as a fly catcher, x., 69.
Menyanthes, alternate ripening of anthers, vii., 60.
" dimorphic flowers of, ix., 92.
Merceya latifolia, n. sp., xvi., 94.
Mertensia, albino, xii., 63.
" notes on, xi., 45.
" Virginica in New Jersey, viii., 58.
" " note on, vii., 79.
Merulius lacrimans, xii., 92.
Michaux's N. Jersey Garden, xi., 88.
Michigan plants, notes on, x., 33.
Micrasterias, n sp,. x., 19; xii., 4.
Microseris, n. sp., x., 88.
Microsphæria, n. sp., x., 75.
Migrations of plants, ix., 11.
Mistletoe, xi., 77.
Mitchella repens, leafy berries in, x., *1.
" repens, white-fruited, x., 3.
" white-fruited, viii., 111.
Mocker-nut, the, xii., 102.
Mollia Boliviana, spec., nov., xvi., 156.
Mollugo verticillata, L., note on, xiv., 218.
Monnina Boliviensis, spec., nov., xvi., 20.
Monotropa, veget. organs of, xii., 132.
Money, parasites of, xii., 71, 101.
Morisonia oblongifolia, spec. nov., xvi., 17.
Moss, a deep-water, xii., 133.
" a new, from Oregon, xiii., 120.
Muhlenbergia Arizonica, Scrib., xv., *8.
Multiplication of spathes in Symplocarpus, ix., 10, 84.
" of spadices in Arisaema, ix., 90.
" of spathes in Richardia, viii., 132.
" of cotyledons in Fagus, viii., 108.
" of flowers in Hepatica, viii., 84.
Mummy garlands, ix , 142; xi., 35.
Myco-lichens, ix., 6.
Myosurus minimus, Linn., xiv., 165.
" revision of, xiii., 1.
" a word concerning, xiii., 61.
Myriadoporus, n. gen., xi., 97.
Naiadaceæ in the Torrey Herbarium, xiii., *153.
Nama densa, n. sp., xvi , 222.
Names of plants, popular, viii., 105.
Names, varietal, gender of, xi., 47, 56.
Narcissus, corona or cup of, ix., 106.

Navicula De Wittiana, n. sp., xvi., *209.
" Schultzei, n. sp., xv., *75.
" trinodis, var. inflata, n. var., xvi., 101.
Necrology, viii., 12.
Nectar, its nature and uses, vii., 91.
Nectar-glands of Aplos, xv., *133.
" " cruciferæ, xii., 10.
Nectria, n. sp., vii., 74; x., 77.
Negundo, polyphylly of gynoecium in vii., 73.
Nelumbium, new station, xii., 30.
Nemophila, cleistogenous, x., 119.
Neopeckia, new genus of fungi, x., 127.
Nesæa, petalody of stamens in, vii., 67.
Nesæa verticillata, on the floating tissue of, xvi., *315.
Nevada and Utah, notes from, x., 69.
Nevada, notes on flora of, ix., 5.
New England, new finds in, viii., 6.
New Jersey, Botanical trip into, xi., 90.
" " floras of, viii., 81.
" " notes from, xi., 32.
New Mexico, new plants of, viii , 97, 121.
New York, floras of, viii., 16.
" " City stations, new, viii., 130.
" " Central, notes from, x., 46.
" " Stations, new, x., 46.
Nidularia, n. sp., xi., 18.
Nitella Macounii, Allen, xv., 11.
Nitella Morongii, n. sp., xiv., *214.
Nitella Muthnatæ, n. sp., xiv., *211.
Nodularia Mainensis, n. sp., xvi., 188.
Nomenclature, a point in, xiv., 167.
" Question and How to Settle it, xv., 230.
North Carolina, notes from, ix., 115.
Notelets, xii., 86.
Notes from New Hampshire, xvi., 329.
" from Queens County, Long Island, xiv., 13.
" from the Saguenay River, xiii., 188.
" from Schenectady, xiii., 39.
Nothoiæna, n. sp., x., 27.
" Grayi, vii., *50.
Nummularia, n. sp., xi., 74.
Nuphar, xiv., 177.
Nutation in Epilobium, ix., 8.
Nymphæa, xiv., 177.
Nymphæa elegans, re-discovery of, xv., 13.
Oak, hybrid, near Keyport, ix., *13.
Oaks, hybrid, viii., 132; ix., 55.
" hybrid, a recent discovery on Staten Island, xv., *303.
" hybrid, near Washington, x., *25.
" variability of, ix., 118.
Œdogonium, n. sp., xii., 126.
Œnothera, n. sp., x., 41, 125.
Onagraceæ, stipules in, xi., 9.
Onoclea, spores of, xii , *8.
" sensibilis, obtusilobata, viii., 101, 109.
Onoclea, sensibilis, var. obtusilobata, ix., 6.
Onondaga Co., N. Y., notes on flora of, x., 121.
Onondaga Indian names of plants, xvi , 54.
Onondaga Plant Names, xv., 214.
Ophioglossum nudicaule, ix., 71.
" palmatum, variations of, viii., 89.
" vulgatum, ix., 55.
Opuntia, fertilization of, x., 79.
" fruit of, xii., 133.
" uses of, xii , 121.
Orange leaf scab, notes on the, xiii., 181.
Orchidaceæ of Spruce Pond, xi., 133.
Orcuttia Californica, Vasey, n. sp., xiii., *219.
Oriole's nest, vegetable fibres in, ix., 57.
Orthotricum Pringlei, C. Mull, n. sp., xiii , 120.
Osmorrhiza as a bur, xi., 92.
Osmunda cinnamomea, var. frondosa, xiii., *62.
Ovary, the ideal, xvi., 77.
Oxalis Andina, spec. nov., xvi., 159.
" Boliviana, spec. nov., xvi , 159.
Oxytheca, n. sp., x., 23.
Pachyphyllosis, xii., 90.
Palms and Pines among the, x., 81.
Palms of the U. S., xi., 68.
Panicum, n. sp., xi., 61.
Panicum Havardii, n. sp., xiv., 95.
Papaw, the, xii., 122.
Parasites of money, xi., 71.
Pardanthus, germination of, xi., *93.
Parkinson's Paradisus, xi., 46.
Parmelia furfuracea in embalming, ix., 152.
Parnassia, ripening of anthers, vii., 59.
Paspalum, synopsis of the genus, xiv., 162.
Peach, Indian, xii., 84.
Pears, prickly, xii., 77.
Pennsylvania, floras of, viii., 81.
Pentstemon, n. sp., x., 127.
" Digitalis, range of, xi., 140.
Peronospora infestans, the mode of destruction of the potato by, xiii , 191.
Periconia, n. sp., x., 50.
Peziza, n. sp., x., 52, 76, 98; xi., 18, 41, 74.
Phæosaccion, new genus of algæ, ix., 66.
Phalloid, an imperfectly described, ix., *123.
Phalloids, odor of and frequency, vii., 30.
Phalloidei of the U. S., list of, vii., 11.
" " additional, vii., 29.
Phanerogams, new or noteworthy North American, xv , 97.
Phegopteris Dryopteris, note on, vii., 118.
Philadelphia, Acad. Nat. Sciences, xi., 138.
Philippine Islands, notes from, xvi , 217.
Phleum, viviparous, vii., *118.
Phoradendron, xi , 87.
" range of, xi., 76.
Photepinasty of leaves, x., 84.
Phyllody of bracts in Alnus, ix., 120.
" of calyx in Trifolium, viii., 113.

Phyllody of ovule in Leontodon, viii., 128.
" of sepals in Trillium, x., 71.
Phyllosticta, n. sp., x., 49, 97; xi., 115.
Physalacria, new genus of fungi, ix., *2.
Physarella, new genus of fungi, ix., *61.
Physarum, n. sp., xi., 50.
Physcomitrium megalocarpum, n. sp., xvi., 94.
Pigments in cell-sap, xi., 35.
Pilosity, deforming, vii., 120.
Pine barren plants in Rhode Island, vii., 98.
Pine-needles, xii., 102, 116.
Pines, bifoliar spurs in, xii., 65.
Pine-seed Wings, examination of, xiii., 245.
Pinus Banksiana on the coast of Maine, xvi., 194.
" Banksiana with Corema Conradii, xvi., 295.
" Banksiana height of, x., 82, 93, 118.
" derivation in, xii., 41.
" edulis, and monophylla, xii., 50, 81.
" Englemann's revision, vii., 39.
" monophylla and Pinus edulis, xiii., 183.
" pungens in New Jersey, xiii., 121.
" rigida in Minnesota, x., 132.
Pirus, heterophylly in, vii., 121.
Plane-tree, gigantic, xi., 58.
Plantago, proliferous, vii., 67.
" phyllody of bracts in, vii., 68.
Plant-exchanges, viii., 93.
" nomenclature, changes in, xi., 102
" Notes from Termiscouata County, Canada, xiv., 230.
" stations wanted, viii., 71.
" absorption of water by, xi., 71.
" action of light on, vii., 110.
" American, some new or little known, xiv., 51.
" and plant-stations, viii., 45.
" aquatic, dimorphic leaves, ix., 141.
" ballast, vii., 122.
" " New York City, viii., 141.
" Californian, new, ix., 31.
" carnivorous, xi., 81.
" chemical constituents of, xi, 108.
" collected by Dr. H. H. Rusby in South America, An enumeration of, xv., 177, 247; xvi., 13, 61, 153, 189, 259, 324.
" drying of fleshy, ix., 92.
" electric phenomena in, ix., 142.
" exchanges, ix., 84.
" extra-limital, xii., 10.
" flowering of, in autumn, vii., 129.
" Garber's Porto Rico, vii., 96.
" growing in trees, x., 58.
" growth of, influence of electriet light, vii., 59.
" growth of, influence of electricity, vii., 37.
" hairs of, vii., 71.
" histo-chemistry of, xi., 94.
Plant of the Detroit River, xiii., 93.
" introduced, Summit County, Ohio, xiii., 187.
" Long Island, xiv., 59.
" male and female, xii., 87.
" migrations of, ix., 11.
" new species of, viii., 97, 121.
" New York City, viii., 130.
" popular names of, viii., 105.
" preserving, xii., 121.
" rarer of N. Y. City, vii., 51.
" rarer, of the valley of the Hudson, xiii., 6.
" respiration of, xii., 63.
" sex in, xi., 58.
" South-western, notes on, xi., 128.
" Texan, new, x., 99.
" two new Florida, xiv., 8.
" varying behavior of, vii., 20.
" Western, new, ix., 62, 121; x., 41, 86, 125.
Platanus occidentalis, xiii., 247.
" " forms of, xiv., 58.
Pleonectria, n. sp., x., 49.
Pleospora, n. sp., x., 53; xi., 75
Poa, n. sp., x., 31.
" argentea, Howell, xv., 11.
" macrantha, Vasey, n. sp., xv., 11.
" rupestris, n. sp., xiv., 94.
Poison oak harmless to cattle in California, vii., 97.
Poisons, action of, upon flowers, x., 11.
Pollen bodies of angiosperms, vii., 60.
" exuberance of, xii., 86.
" Germination of, xvi., 130.
" Measurements, Observations upon, xvi., 135.
Polygala, n. sp., x., 125
" Andina, spec. nov., xvi., 19.
" formosa, spec. nov., xvi., 19.
" and Lechea, note on, viii., 115.
Polygonum Careyi, note on, viii., 48.
Polypetalae, some Californian, xiii., 141, 216.
Polyphylly of corolla in Houstonia, ix., 10.
" " " " Claytonia, ix., 140.
" " gynœcium in Fraxinus, ix., 11.
" " bracts in Hepatica, ix., 10.
" " corolla in Trillium, x., 57.
" in Asclepias, viii., 132.
" " Eupatorium, viii., 132.
" " Lysimachia, viii., 60.
" " Silphium, viii., 132.
Polyporus, n. sp., xi., 26.
" odd form of, xii., *29.
" volvatus and its varieties, vii., *102.
Polytrichum Macounii, n. sp., xvi., 96.
Pontederia, maturation of seeds, vii., 97.
Poplar, a large, xii., 79.
" Lombardy, origin of, xii., 74.
Populus grandidentata, leaf forms of, xiii., *89.

Populus heterophylla, L., note on the flowers of, xv., 114.
Populus, Notes on, xiv., 57.
Portulaca oleracea, note on, viii., 115.
Potamogeton Curtisii, n. sp., xiii, 145.
" Wrightii, n. sp., xiii., *158.
Potamogetons in W. New York, x., 93.
Potato, a curious, xiii., *39.
Potentilla congesta, var. lobata, n. var., xvi., 221.
Potentilla laxiflora, n. sp., xvi., 151.
Preserving Plants for Herbaria, Schweinfurth's method of, xv., 292.
Presque Isle, flora of, vii., 19.
Prolification in Daucus. ix., 151.
" " Erigeron, ix., 141.
" " Gratiola, 139.
" " Plantago, ix., 10.
" " Ranunculus, x., 141.
" " Symplocarpus, ix., 10.
" " Verbena, ix., 141.
" " Phleum, xi., 120.
Prize, de Candolle, xii., 13.
Proterogyny in Spartina, x., 75.
Protium Bolivianum, spec. nov., xvi., 189.
Protoplasm, continuity of, x., 133; xi, 107; xii., 55.
Psilocarya nitens (Vahl.), Britton, xv., 101.
Psilotum triquetrum, new station, ix., 128.
Ptelea, wingless-fruited, xi., 10.
Pteridophyta of Litchfield, xi., 7.
Pteris with caudate pinnules, vii, 114.
Puccinia, n. sp., xi., 49; xii., 34.
Purslane, night-closing of leaves, ix., 153.
Pyrenophora, n. sp., xi., 28.
Pyrenothamnia, n. gen. of lichens, x., 22.
Quercus, n. sp., x., 91.
" alba, peculiar leaves in, viii., *126.
" " plurality of embryos in, xiii., *95.
" Muhlenbergii, note on, xiii., 40.
" nigra, xii., 115.
" palustris, striped acorns, ix., 57.
" polyphylly of gynœcium in, xii., 101.
" prinoides, xii., 119.
" rubra, aromatic leaves, xi., 117.
Racomitrium Macounii, n. sp., xvi., 93.
Ramalina, n. sp., x., 43.
Ramularia, n. sp.,. xi, 122.
Rangely Lakes, A trip among the, xvi., 263.
Ranunculus aquatilis, var. hispidulus, n. var., xvi., 150.
" Cymbalaria, hirsute, viii., 59.
" petalody of stamens in, vii., 113.
" some Californian, xiv., 116.
Raulia, new genus of the Musci, vii, 16.
Redfieldia, a new genus of grasses, xiv., *133.
" flexuosa, n. sp., xiv., *133.
Redwood, qualities of, xii., 90.
Reliquiæ Rafinesquianæ, xii., 37.
Reviews of Foreign Literature, xv., 86, 116, 139, 169, 194, 237, 268, 320; xvi., 25, 79, 113, 137, 165, 197, 222, 248, 279, 331.
Rhabdonema Atlanticum, n. sp., xvi, *75.
Rhexia, fertilization of, viii., *102.
Rhinotrichum, n. sp., xi., 18.
Rhizocarpeæ, The systematic position of, xv., 258.
Rhode Island, floras of, viii., 8.
Rhododendron of Pontus, xi., 10.
" Vaseyi, Another station for, xv., 164.
" Notes on two, xvi., 220.
Rhubarb culture, xii., 90.
Rhus, adventitious leaves in, vii., 91, 98.
" cotinoides, rediscovery of, ix., 153.
Ricinus, a tree in California, vii, 97.
Robinia, irritability in, vii., 92.
Robinson, J. F., death of, xii., 10.
Rœstelia, n. sp., x., 74.
Rondeletia cordata, note on, viii., 71.
Rosa humilis, var. lucida, n. var., xiv., 256.
" " " villosa, n. var., xiv., 256.
" minutifolia, fruit of, ix., 127.
" proliferous, vii., 68.
" Remarks on the group Carolinæ of the genus, xiv., 255; xvi., 161.
" new North American, ix., 97.
Roselinia, n. sp, xi., 74.
Rot, dry, xii., 92.
Rourea Bakerana, spec. nov., xvi., 192.
Rubus, phyllody of calyx in, vii., 56.
" petallody of stamens in, vii., 68.
" fasciation in, x., 48.
Rudbeckia Missouriensis, xv., 94.
Sabal umbraculifera, xiv., 72.
Sagittaria with dark purple flowers, vii, 98.
Salicornia, note on, viii., 130.
Salisburia adiantifolia, xi., 134.
Salix balsamifera, Barratt, xv., 121.
" brittle branches of, ix., 82, 89, 90.
" pistillody of stamens in, vii., 55, 56.
" stamens within ovary of, viii., 76.
" synopsis of Northern species, vii., 89.
Salviniaceæ, xv., 261.
Sam's Point, N. Y., flora of, x., 105, 121.
San Francisco Peninsula, changes in plant-life, vii., 35.
Sanguinaria Canadensis, notes on, xiv., *74.
Sarracenia, hexamerous, vii., 88.
Sarracenia variolaris, note on, xiv., 229.
Sassafras tree, a large, vii., 67.
Saurauja Rusbyi, spec. nov., xvi., 64.
Savoyanne, the word, xii., 72.
Saxifraga, petalody of stamens in, vii., 69.
" Virginiensis, some anomalous forms of, xiv., 122.
" Virginiensis, var. pentadecandra, n. var., xiv., 124; xv., 166.
Scirpus heterocarpus, xv., *103.

Scirpus Pringlei, n. sp., xv., *103.
Schizoxylon, n. sp., xi., 42.
Scleria graminifolia, n. sp., xv., 104.
Scorzonella arguta, n. sp., xvi., 152.
Scrophularia, fertilization of, viii., *133.
Seeds, latent vitality of, ix., 131.
" Leguminous, structure of the testa of several, xiii., *17.
" of gourd, vitality of, vii., 102.
" of solidago, vitality of, vii., 35.
" thickly sown, influence on sex, vii., 22.
" of weeds, xiv., 111.
Senecio, n. sp., x., 87.
Septoria, n. sp., x., 97; xi., 73, 115; xii., 33.
Setaria, fission of spike in, vii., 101.
Setaria glauca and viridis, Note on, vii., 15.
Sex in plants, xi., 58.
Sherardia arvensis, in Canada, xiv., 14.
" " L., xiv., 238.
Shortia, xii., 10.
" note on, xi., 136.
Sida Benensis, spec. nov., xvi., 153.
Silene with 5-merous ovary, viii., 32.
" insectivorous, vii., 34.
Simblum rubescens, vii., *8.
" " in Iowa, viii., 126.
Sisymbrium Rusbyi, spec. nov., xvi., 16.
" Thaliana biennial, vii., 21.
Sisyrinchium, xi., 80.
Slight varieties, Classification of, xvi., 270.
" " Remarks on, xvi., 272.
Smilaces, Proposed Revision of North American, xv., 86.
Smilax herbacea, L., A suggestion concerning, xv., 189.
" pumila, Walt., Notes on, xv., 51
" Some peculiarities in the seed of, xv., 162
Snake, lignified, from Brazil, x., 10.
" " ix., *137, 152.
Snowberries, poisoning by, xii., 64.
Snow, red, xii., 131.
Solana, crossing, xii., 118.
" tuberous, xi., 34.
Sophora, fasciation in, xiv., 37, 68.
Sorosporium, n. sp., ix., 7.
South American Vegetation, First Glimpses of, xvi., 43.
Sparganium, xv., *73.
" androcladum (Engelm.), var. fluctuans, Morong, n. var., xv., 78.
" androcladum (Engelm.), var. multipedunculata, n. var., xv., 79.
" Greenei, n. sp., xv., 77.
Spartina, notes on, x., *85.
" proterogyny in, x., 75.
Spergula, etymology of word, xii., 59.
Sphærella, n. sp., x., 75, 98, 117; xi., 75, 122, 123.
Sphaeria, n. sp., x., 53, 54, 90; xi., 42.
Sphaeria, a new on grapes, vii., 90.
" Solidaginis, development, viii., 29.
Sphagnum, notes on the genus, ix., 105.
Spicaria, n. sp., x., 97.
Spines in cactus, use of, xii., 60.
Spores of Lycopodium, xii., 55.
" of Onoclea, xii., *8.
Sporobolus, n. sp., x., 52, 128.
" annuus, n. sp., xiv., 9.
" interruptus, xv., *8.
" racemosus, n. sp., xiv., 9.
" Shepherdi, n. sp., xiv., 8.
Staminody in Narcissus, vii., 60.
Staphylea, late flowering of, ix., 144.
Starch in tracheal ducts, xiv., 77.
" in the wood of chestnut, notes on, xi., 122.
Staten Island, N. Y., notes from, xiii., 144.
Staurastrum, n. sp., x., 19, 20; xii., 4, *128.
Staurothele, n. sp., xi., 26.
Stegonosporium, n. sp., x., 76.
Stictis, n. sp., x., 76.
Stigmatidium inscriptum, spec. nov., xvi., 105.
Stilbospora, n. sp., xi., 18.
Stipa, n. sp., xi., 42; xv., 125.
Stipules in Onagraceæ, xi., 9.
Stomata, On the opening of, xv., *287.
Strait of Magellan, Botanizing in the, xv., 15, 105.
Subularia aquatica, xi., 118.
" " New locality for, xvi., 291.
Suggestion, a, ix., 82.
Suppression of involucre in Anemone, ix., 120.
" of leaflets in Carya, viii., 132.
Survival of the fittest, x., 53.
Sweet cicely as a bur, xi., 92.
Sweet potato, a character of the, ix., 130.
Sycocarpus, gen. nov., xiv., 143.
" Rusbyi, n. sp., xiv., 143.
Symphoricarpus racemosus, var., viii., 114.
Symplocarpus fœtidus, (L.), Salisb., The Development of, xv., *151.
Synanthy in Fuchsia, xv., *102.
Syncarpy in Prunus, ix., 120.
Synopses, artificial, vii., 86.
Synspermy in horsechestnut, xi., 119.
Syracuse Botanical Club, xi., 47.
Syracuse, Notes from, xii., 96.
Tamarinds, x., 70.
Taraxacum, fasciation in, vii., 68.
Teratological notes, ix., 10, *102, 140; x., 9, 122.
Teratology, xi., 67, 119.
Thalictrum, petalody of stamens in, vii, 97.
" or Anemone, which? x., 56.
Thinouia coriacea, spec., nov., xvi., 191.
Thuja gigantea, xii., 66.
Tiarella cordifolia, seeding of, viii., 80.
Tigridia, tetramerous, vii., 83.
Tilia, Bract in, xv., 316.
Tillandsia, new stations for, viii., 6.

Tillandsia, the name, xii , 79.
Timber in Texas, xi , 81.
" strength of, xi., 47.
Tissa macrotheca, var. scariosa, n. var., xv., 129.
" pallida, n. sp , xv., 129.
" Preliminary Note on the North American Species of the Genus, xvi , 125.
Toadstools, prep. for herbarium, viii., 21.
Tolypella Macounii, n. sp., xiv., *212.
" the American species of, x., *109.
Tomato, history of, xii., 78.
Torenia Asiatica, fertilization of, ix., *51.
Trees, forest, along N. Pacific R. R., xi., 21.
" large, vii., 57, 67, 101, 121.
" " near New York City, vii., 81, 107.
" annual growth of, vii , 71.
" growth of, xii., 82.
" of the United States, xii., 75.
" of the South-west, ix., 53, 78, 106.
Tricardia Watsoni, ix., 92, 116.
Triceratium Heilprinianum, n. sp., xvi., *210.
" indentatum, n. sp., xvi., *210.
" Kainii, n. sp., xvi., *76.
T. Kainii, var. constrictum, n. var., xvi., *210.
Trichomanes, radicans in Tennessee, vii , 16.
Trifolium, funnel-shaped leaves in, x., 70.
Trigger-hairs of the Thistle Flower, xv., *82.
Trigynella Boliviensis, spec. nov., xvi., 14.
Trillium, phyllody of sepals in, x., 71.
" polyphylly of corolla in, x., 57.
Trisetum, n. sp., x., *64 ; xi., 6 ; xii., 6.
Trollius, etymology of word, xii., 59.
Troximon, n. sp., x., 88.
Trunks of trees, changes in diameter, viii.
Tubuliflorai Compositæ, On irregular tendencies in, xv., 266.
Tuckahoe, etymology of, ix., 115.
" notes on, ix., 125, 140, 152 ; xi , *1.
Tulip tree, the ancestors of, xiv., *1.
Typha, fission of spike in, vii., 68.
Typha, xv., *1.
Typhaceæ, Studies in the, xv , *1, 73.
Umbelliferae, artificial synopsis of, vii , 87.
" oil receptacles of xii., 55.
Unifolium, xv., 285.
Union of an oak with a birch, xiii., 221.
Uredo, n. sp., xii., 36.
Uromyces, n. sp , x., 74.
Ustilago, n. sp., x , 7 ; xii., 35.
Utah, notes from, viii., 70, 75 ; x., 32.
Utricularia, fish killed by, xi., 82.
" resupinata, Note on, vii., 19.
Valsa, n. sp., x., 89, 118 ; xi., 27, 28.
Valsaria, n. sp., xi., 28.
Varietal names, gender of, xi., 47, 56.
Varieties, Classification of slight, xvi., 270, 272, 328.
Vase, the Gray, xii., *116.
Vegetable tissue, contraction under frost, x., 83.
Vegetation, effect of climate on, xi., 81.
" micro-,of bank notes, xi., 101.
" sunlight and, xii., 64.
" influ. heat and cold, xii., 64.
" insular, xii., 103.
Veltheimia, proterandry in, xiii., 62.
Venation, new terminology of, vii., 37.
Verbascum, a hybrid, ix., 10, 141.
" Lychnitis, xii., 83.
Vernation of Botrychium boreale, vii., 115.
" in Botrychia, viii., 100.
Veronica, note on, xii., 48.
Vincetoxicum nigrum, ix., 106, 120.
" Scoparium, ix., 115.
" etymology of word, xii., 60.
Viola, the genus, xi., 59.
" Boliviana, spec. nov., xvi., 18.
" Bridgesii, spec. nov., xvi., 18.
" peloric, vii., 98.
" sagittata, variations in, vii., 27.
" thymifolia, spec. nov., xvi., 18.
Violet, round-leaved, note on, viii , 47.
" with runners, x , 57.
Violets, notes on New Jersey, xiv., 76.
Virescence in Leontodon, viii., *128.
" in Thalictrum, viii., 60.
" in Rosa, ix., 155.
Virgaria, n. sp., x., 97.
Volvox globator, xi., 10.
Walnut tricotyledonous, x., 122.
Websteria, gen. nov., xiv., 135.
" limnophila, sp. nov., xiv., 135.
" submersa, xv., 99.
Weeds, distribution of, x., 24.
" seeds of, xii., 111.
" the migration of, ix., 112.
Westchester Co., N. Y., gleanings in, ix., 35.
Williamson, John, death of, xi., 104.
Willows, White Mountain, xv., *121 ; xvi., 39, 211.
Wissadula Andina, spec., nov., xvi , 153.
Wolffia gladiata var. Floridana, vii. 64.
Wood, Alphonso, viii., *53.
Woodsia obtusa, xiii., 116.
Woodwardia, angustifolia in Mich., viii., 47.
Wool, fir leaf, xii., 66.
Xanthidium, n. sp., xiv., 8.
" cristatum, var. truncatum, n. var., xvi., 186.
Yaupon, the, xii., 63.
Young, Alfred R., death of, x., 57.
Yucca, nectary of, xiii., *135.
Zanthoxylum, n. sp., x., 90.
Zea, eversion of axis in, vii., 69.
Zygnema, n. sp., xii., 126.

INDEX TO ILLUSTRATIONS.

VOL.	PAGE.	FIG.	CUTS IN THE TEXT.	AUTHOR.
I.	35	5	Lemna Valdiviana	T. F. Allen.
II.	34	1	Trowel	F. J. Bumsted.
VII.	54	1	Cross-section of Carya alba	H. C. Beardslee.
"	104	3	Polyporus volvatus	C. H. Peck.
"	119	1	A viviparous grass	W. R. Gerard.
VIII.	10	1	New illustration of cell formation	
"	36	1	Heterophylly in Hepatica	W. R. Gerard.
"	41	2	A simple dendrometer	C. E. Bessey.
"	54	1	Portrait of Alphonso Wood	
"	78	5	Cohesion of glumes in Agrostis elata	F. L. Scribner.
"	103	2	Fertilization of Rhexia Virginica	Wm. H. Leggett.
"	113	1	Ilex opaca with entire leaves	J. H. Mellichamp.
"	126	1	Peculiarly lobed leaves in Quercus alba	N. L. Britton.
"	128	1	Virescence in Leontodon	W. W. Bailey.
"	134	4	Fertilization of Scrophularia	Wm Trelease.
IX.	14	5	Acorns of Quercus Rudkini	N. L. Britton.
"	51	4	Torenia Asiatica	W. W. Bailey.
"	83	1	Germination of Iris versicolor	Joseph Schrenk.
"	91	1	Adhesion between two beeches	
"	102	6	Teratological Notes in Fuchsia	Wm. Trelease.
"	129	1	Abnormal Pteris aquilina	Arthur Hollick.
"	137, 139	2	Some phenomena connected with the Cambium layer	C. C. Parry.
X.	51	2	Cucurbita Californica	
"	54	1	Morphology of the Jerusalem Artichoke	H. W. Ravenel.
"	64	3	Deyeuxia Tweedyi	F. L. Scribner.
"	65	4	Trisetum Brandegei	" "
"	77	4	Glyceria Canbyi	" "
"	78	1	Agropyrum dasystachyum	" "
"	82	1	Abnormal Cotyledons in Ipomœa	W. W. Bailey.
"	100	6	Fruit of Eustichium Norvegicum	E. G. Knight.
"	119	2	Fern Notes	D. H. Campbell.
"	128	1	Agropyrum Scribneri	George Vasey.
XI.	31	6	Development of Dodecatheon	A. F. Foerste.
"	33	2	Abnormal Carya porcina	F. L. Harvey.
"	39	1	Portrait of George Engelmann	
"	62, 63	4, 9	Podophyllum peltatum	A. F. Foerste.
"	64	2	Prickles of Robinia	" "
"	93	1	Germination of Pardanthus Chinensis	J. Schrenk.
"	123	4	Nectar glands in Apios tuberosa	A. F. Foerste
"	124, 125	3, 2	Leaf scars	" "
XII.	8	5	A new coat in the spore of Onoclea	D. H. Campbell.
"	17-20	13	Anthesis in Ericaceæ	H. H. Rusby.
"	29	1	Mimicry in a fungus	W. R. Gerard.
"	71	1	Bronze medallion of Asa Gray	
"	116	1	Vase presented to Asa Gray	
XIII.	39	1	A curious potato	A. F. Foerste.
"	95	3	Plurality of embryos in Quercus alba	E. G. Britton.
"	136	3	Yucca filamentosa	Wm. Trelease.
"	199, 238, 240	4	Pores of the libriform tissue	E. L. Gregory.

CUTS IN THE TEXT.

VOL.	PAGE.	FIG.		AUTHOR.
XIV.	33	1	Iron press	C. E. Smith.
"	74	5	Sanguinaria Canadensis	A. F. Foerste.
"	96	1	Asteromphalus Roperianus, var	E. A. Schultze.
"	120	9	Dicœcism in Anemone acutiloba	B. D. Halsted.
"	180	1)	Dehiscence of the sporangium in Adiantum pedatum	F. M. Lyon.
"	181	3)		
XV.	67	15	Studies in the Typhaceæ	Thos. Morong.
"	9	1	Bromus Pumpellianus	F. L. Scribner.
"	83	6	Trigger-hairs of the Thistle flower	B. D. Halsted.
"	213	1	Abnormal Ash leaves	B. D. Halsted.
"	288)	6	On the Opening of stomata	F. Roth.
"	291)			
XVI.	22	3	Lycopodium lucidulum	E. E. Sterns.
"	164	1	Viola palmata	J. I. Northrop.
"	165	2	Synedra pulchella var. abnormis	E. A. Schultze.
"	212	1	Salix argyrocarpa	M. S. Bebb.

PLATES.

VOL.	NO.		AUTHOR	PAGE.
I.		Spirodela	C. F. Austin	38
IV.		Portrait of Dr. Torrey		9
VI.		Vernation in Botrychium	G. E. Davenport	196
"		A Nostoc the matrix of Scytonema	F. Wolle	218
VII.	I.	Simblum rubescens	W. R. Gerard	8
"	II.	" "	" "	8
"	III.	Cyperus ovularis and C. cylindricus	N. L. Britton	48
"	IV.	Notholæna Grayi	G. E. Davenport	50
"	V.	New American Desmids	F. Wolle	91
VIII.	VI.	" " "	" "	1
"	VII.	Ascomycetella Quercina	C. H. Peck	49
"	VIII.	Cheilanthes Parishii	G. E. Davenport	61
IX.	IX.	Fungi in wrong genera	C. H. Peck	1
"	X.) XI. XII.)	On a new Hybrid Oak near Keyport, New Jersey	N. L. Britton	13
"	XIII.	New Fresh-water Algæ	F. Wolle	25
"	XIV.	Fruits of Cucurbita	C. C. Parry	30
"	XV-XXII.	Development of the Cortex in Chara	T. F. Allen	37
"	XXIII.	" " root-stock in Dicentra	Joseph Schrenk	47
"	XXIV.	New species of fungi	C. H. Peck	61
"	XXV.	Phallus Ravenelii	" "	122
X.	XXVI.	Leafy berries in Mitchella repens	W. R. Dudley	1
"	XXVII.	New fresh-water Algæ	F. Wolle	13
"	XXVIII.) XXIX.) XXX.)	Three hybrid Oaks near Washington	George Vasey	25
"	XXXI.) XXXII.) XXXIII.)	Haustoria of North American Parasitic Phanerogams	Joseph Schrenk	37
"	XXXIV.	Cheilanthes Pringlei	G. E. Davenport	61
"	XXXV.	Boletus Morgani	C. H. Peck	73
"	XXXVI.	Spikelets of Spartina	F. L. Scribner	85
"	XXXVII. to XLII.)	American species of Tolypella	T. F. Allen	109
XI.	XLIII.	Notes on Tuckahoe	J. Schrenk	1
"	XLIV.	Desmids of the United States	F. Wolle	13
"	XLV.	Cathestechum erectum, V. & H	George Vasey	37
"	XLVI.	Haustoria of North American Phanerogams	J. Schrenk	109

VOL.	NO.	PLATES.	AUTHOR.	PAGE.
XII.	XLVII.	New Desmids of the United States	F. Wolle	1
"	XLVIII.	Notes on Limnanthemum	J. Schrenk	13
"	XLIX.	New species of Fungi	C. H. Peck	33
"	L.	The genus Cintractia	Wm. Trelease	69
"	LI.	New Desmids of the United States	F. Wolle	125
XIII.	LII. LIII.	Structure of seeds of several Leguminous Plants	L. H. Pammel	17
"	LIV.	Development of the Antheridium in Ferns	D. H. Campbell	49
"	LV.	Variation of Osmunda cinnamomea	E. H. Day	63
"	LVI.	Bauhinias living and fossil	J. S. Newberry	77
"	LVII.	Leaf-forms of Populus grandidentata	N. L. Britton	89
"	LVIII.	Notholæna Pringlei, n. sp.	G. E. Davenport	129
"	LIX	Potamogeton Wrightii, n. sp	Thos. Morong	153
"	LX.	Orcuttia Californica	George Vasey	219
XIV.	LXI. LXII.	Cretaceous Liriodendra	J. S. Newberry	1
"	LXIII. LXIV. LXV.	Cerastium arvense and its N. American varieties	N. L. Britton Arthur Hollick	89
"	LXVI.	Diatoms of Staten Island	E. A. Schultze	69
"	LXVII.	Sanguinaria Canadensis	A. F. Foerste	74
"	LXVIII.	Asplenium rhizophyllum, var., Biscaynianum	D. C. Eaton	97
"	LXIX.	Diatoms of Staten Island	E. A. Schultze	109
"	LXX.	Redfieldia flexuosa	George Vasey	133
"	LXXI.	Chara muthnatæ, n. sp	T. F. Allen	211
"	LXXII. LXXIII.	Tolypella Macounii, n. sp	" "	212
"	LXXIV.	Chara succincta, R. Br	" "	213
"	LXXV.	Nitella Morongii, n. sp	" "	214
XV.	LXXVI.	New or little known Grasses	F. L. Scribner	8
"	LXXVII. LXXVIII.	Brasenia peltata	Jos. Schrenk	29
"	LXXIX.	Studies in the Typhaceæ	Thos. Morong	1
"	LXXX.	Scirpus Pringlei	N. L. Britton	103
"	LXXXI.	Salix balsamifera, Barratt	M. S. Bebb	121
"	LXXXII.	Development of Symplocarpus	A. F. Foerste	151
"	LXXXIII.	Quercus rubra and Q. Phellos	A. Hollick	303
"	LXXXIV. LXXXV.	" heterophylla, Michx	" "	303
"	LXXXVI.	Development of Corynites Curtissii	J. F. James	314
XVI.	LXXXVII. LXXXVIII.	On some marine Algæ	W. G. Farlow	1
"	LXXXIX.	Fossil marine Diatomaceous deposit from Atlantic City, N. J.	C. H. Kain E. A. Shultze	71
"	XC.	Staten Island Diatoms	E. A. Schultze	98
"	XCI.	Grimmia torquata	E. G. Britton	106
"	XCII. XCIII.	Fossil marine Diatomaceous deposit from Atlantic City, N. J.	C. H. Kain. E. A. Schultze	207
"	XCIV.	Nasturtium lacustre	A. F. Foerste	266
"	XCV. XCVI. XCVII.	Nessea verticillata	Jos. Schrenk	315

GENERIC INDEX.

Abies, vii., 102; viii., 4, 23; ix., 34, 156; x., 45, 47, 67; xi., 22, 23, 24, 40, 81, 82; xii., 24, 90, 100, 103; xiii., 72, 79, 85, 87, 88, 124, 173; xiv., 15, 100; xv., 128, 136; xvi., 116, 146, 167, 305, 311.
Abilgaardia, xv., 102.
Abola, ix., 135.
Abronia, xvi., 174.
Abrus, xii., 54.
Abuta, xvi., 15.
Abutilon, viii., 120; x., 81, 132; xi., 8, 19; xiii., 128; xiv., 96, 101, 245; xvi., 153, 154.
Acacia, ix., 142; x., 81; xii., 119; xiv., 162; xv., 95, 110, 197; xvi., 47, 280, 310, 327.
Acalypha, xvi., 66.
Acæna, xiv., 164; xv., 17, 106.
Acantholemon, xiv., 266.
Acanthomintha, x., 81.
Acanthospermum, vii., 194; ix., 113; xiv., 44.
Acanthus, xiv., 86.
Acaulon, xv., 114.
Acer, vii., 25, 56, 73, 97; viii., 66; ix., 106, 156; x., 45, 70, 83, 105; xi., 23, 28; xii., 53, 67, 82; xiii., 6, 38, 60, 101, 233; xiv., 78, 186, 194, 230, 232; xv., 135; xvi., 60, 136, 168, 257, 287.
Acerates, xii, 11; xv., 53.
Achætogeron, xv., 94.
Achillæa, vii., 124; ix., 114, 156; x., 120; xii., 103; xiii., 246; xiv., 234; xv., 136; xvi., 288.
Achlys, xiv., 120.
Achnanthes, xiv., 28, 29; xv., 131.
Acicarpha, xvi., 44.
Acnida, xiii., 61.
Acinophora, xii., 37.
Acolium, x., 22.
Aconitum, viii., 9; xi., 36; xii., 25, 52; xiii., 75, 190; xiv., 198, 178.
Acorus, x., 9; xiii., 94.
Acrospermum, viii., 124.
Acrostichum, vii., 61; viii., 79, 120; x., 12; xiv., 168; xv., 145, 181, 252; xvi., 30.
Actæa, xiii., 169, 196; xiv., 231; xv., 58, 126, 135; xvi., 270.
Actinella, xi., 103, 129, 130; xv., 214.
Actinocyclus, xiv., 175; xvi., 72.
Actinodiscus, xvi., 72.
Actinoptychus, xiii., 124; xiv., 141; xv., 131; xvi., 73.
Actinolepis, x., 81.
Actinomeris, xi., 103; xiii., 116.
Actinomyces, xii., 92.
Adenostephanus, xvi., 168.
Adenostoma, x., 106.
Adesmia, vii., 124; xvi., 261.
Adhatoda, xv., 198; xvi., 168.
Adiantum, vii., 80, 81, 94, 95, 96, 121; viii., 32, 79, 94; ix., 114; x., 33, 59, 102; xi., 7; xii., 48; xiii., 73, 99, 129; xiv., 16, 37, 180, 202; xv., 107, 248, xvi., 84.
Adlumia, x., 9; xiii., 6, 60, 71; xv., 220.
Adonis, xii., 38; xiii., 238.
Adoxa, xvi, 304.
Æchmea, xiv., 59; xvi., 227.
Æcidium, viii., 34, 66; x., 74, 75; xi., 32, 50, 58, 64, 65, 73, 92, 114; xii., 35, 44; xiii., 95, 194; xiv., 239; xv., 106, 119, 145, 149, 273; xvi., 173, 196.
Ædycia, vii., 30; xii., 37.
Ægilops, ix., 137; x., 32.
Ægopogon, ix., 135; xi., 38; xiii., 230.
Æschynomene, xvi., 260.
Æsculus, x., 98; xi., 114, 119; xiii., 79; xvi., 310.
Æthalium, xii., 89.
Æthusa, vii., 87; viii., 9; ix., 150.
Agaricus, vii., 34, 58; viii., 15, 57; ix., 18; xii., 33, 67; xiii., 127, 175, 196, 247; xiv., 220, 244; xvi., 84, 88, 116, 173, 252.
Agarum, xiii., 222.
Agave, x., 107, 123; xi., 41; xii, 120; xiii., 123; xiv., 201, 241; xv., 236, 239, 273; xvi., 48, 227.
Ageratum, vii., 112; xiv., 67.
Agrimonia, vii., 52; xiii., 116, 173; xiv., 193, 233.
Agropyrum, ix., 135, 137; x., 8, 32, 78, 128; xi., 139; xiii., 42; xvi., 70, 145, 231.
Agrostis, vii., 12; viii., 78; ix., 104, 105, 135, 136, 151; x., 8, 21, 43, 63; xiii., 55, 73; xiv., 38, 262; xvi., 329, 336.
Agyrium, xvi., 87.

Ahnfeldtia, xiii., 111.
Ailanthus, xi., 84, 125; xii., 79; xiv., 37.
Allographum, viii., 65.
Aira, ix., 135, 136, 146; x., 8, 64; xiii., 73.
Ajuga, vii., 125.
Akokanthera, xiv., 87.
Alabastra, vii., 36.
Alaria, xiii., 109; xiv, 220; xvi., 9.
Albertia, vii., 76.
Alchemilla, vii., 124; xiii., 232; xiv., 10, 12, 43.
Alectoria, x., 22; xv., 184; xvi., 199.
Aletes, xvi., 122.
Aletris, vii., 113; xiii., 5.
Alfredia, xiii, 195.
Alisma, xiii., 61, 94; xvi., 290.
Allium, vii., 26, 54, 69, 74; viii., 81; ix., 5; x., 9, 96; xiii., 137, 138; xv., 89, 133, 223, 243; xvi., 34, 86, 152, 244.
Allocarya, xiv., 100; xv., 25, 93.
Alnus, vii., 25; viii., 74; ix., 20, 79, 84, 98, 120, xi., 23; xii., 82; xiii., 73, 244; xiv., 128, 230; 236; xv., 130; xvi., 112, 124, 289.
Aloe, xii., 48.
Alopecurus, vii., 58; viii., 142; ix., 23, 134; x., 8, 63, 102; xiii., 176; xiv., 262; xv., 12, 48.
Alsodeia, xvi., 18.
Alsophila, xv., 248.
Alternanthera, vii., 125.
Alternaria, x., 52.
Althæa, viii., 29; x., 135; xi., 35.
Althenia, xiii., 159.
Alyssum, xi., 94; xii., 48, 60; xiii., 128, 223, 252; xv., 200; xvi., 16.
Amanita, viii., 57; xi., 12; xiv, 77.
Amarantus, vii., 18, 125; x., 120; xiii., 46; xiv., 226; xv., 246, 271; xvi., 59, 123, 133, 289.
Amaryllis, xiii., 7, 173, 225.
Amblystegium, vii., 64.
Ambrosia, xiii., 31, 246; xiv., 35, 67, 245; xv., 149; xvi., 145, 288.
Amelanchier, viii., 72, 90; ix., 36, 112, 150; x., 70; xii., 82; xiii., 95, 179; xv., 199, 222; xvi., 237.
Amianthium, xiii., 75; xiv., 14; xvi., 204.
Amicia, xvi., 260.
Ammania, viii., 120; x., 120; xiii., 5.
Ammobroma, xvi., 335.
Ammophila, ix., 135, 136; xi., 7; xiii., 246; xv., 117, 294.
Ammoselinum, xv., 57.
Amorpha, x., 120, 136; xiv., 127; xv., 55; xvi., 51.
Ampelopsis, vii., 86; ix., 82, 112; xii., 82; xiii., 148, 251; xiv., 102, 108; xvi., 251.
Amphiachyris, xiv., 200.
Amphiloma, xiv., 222.
Amphicarpæa, xv., 54.
Amphicarpum, ix., 134; xvi., 231.
Amphiprora, xiv., 29, 141, 149; xv., 130, 131.
Amphisphæria, x., 54, 127.
Amphipleura, xv., 183.
Amphitetras, xvi., 73.
Amphora, xiv., 27, 28, 29, 175; xv., 120, 183.
Amphoridium, xvi., 109.
Amsinckia, viii., 142.
Anabæna, vii., 100; x., 21; xiii., 93.
Anacardium, xvi., 91.
Anacharis xi., 84; xiii., 94, 170; xv., 112.
Anagallis, xii., 48; xiii., 60; xiv., 147, 164; xvi., 44.
Ananas, xvi., 282.
Anaulus, xvi., 208.
Anaphalis, xi., 103; xiii., 195; xiv., 230, 234; xv., 128.
Anastatica, vii., 60.
Anchietea, xv., 138.
Andira, xvi., 325.
Andreæa, xv., 186.
Andropogon, vii., 12, 82, 114; viii., 65, 74, 90, 120; ix., 52, 73, 75, 87, 135, 136; x., 7, 35, 36; xiii., 249; xiv., 99; xv., 117, 257, 294; xvi., 30, 33, 53, 173, 233, 236.
Andromeda; vii., 82; viii., 91, 113; x., 12, 67; xi., 11; xii., 17, 20, 53, 68, 82; xiii., 5, 36, 203; xiv., 171, 191, 235, 262; xvi., 119, 228, 247, 264.
Androsace, xii., 25.
Aneimia, viii., 94; ix., 69; x., 11; xiii., 82.
Anemone, vii., 51, 99; viii., 36, 81, 92, 130; ix., 96, 120; x., 56; xi., 55; xiii., 6, 29, 42, 114; xiv., 22, 68, 102, 119, 136, 147, 148, 153, 231; xv., 17, 106, 135, 147, 204, 320; xvi., 13, 252, 287.
Anemonella, xiii., 42, 251.
Anemopsis, xiii., 177.
Anethrum, vii., 124.
Aneura, xv., 202; xvi., 79.
Angelica, vii., 87; xiii., 73, 76; xiv., 79; xv., 56, 174, 301.
Anhalonium, xv., 284; xvi., 227.
Anisacanthus, x., 74.
Anisotheeium, xvi., 107, 124.
Annesiia, xv, 115.
Annularia, vii., 76.
Anœctangium, xvi., 109.
Anoda, xiv., 101.
Anomozamites, xii., 91.
Anona, xvi., 14.
Antennaria, viii., 81; x, 69; xi., 83, 103; xii., 25, 26; xiii, 189, 195; xiv., 146, 261; xv,, 58, 128.
Anthænantia, ix., 134.
Antirrhinum, x., 126.
Antitrichia, xvi., 111.
Anthemis, vii, 74; viii., 84; xi., 103; xiii., 116; xiv., 14, 146, 148, 163; xvi., 288.
Anthenantia, xvi., 231.
Anthericum, viii., 122.
Anthoceros, xiv., 240; xv., 202.
Anthopogon, ix., 135.

Anthostoma, ix., 73.
Anthostomella, xi., 42.
Anthoxanthum, vii, 98; ix., 135.
Anthriscus, xv., 57.
Anthurium, vii., 49; xv., 199.
Anthurus, viii., 96.
Anthyllis, vii., 124.
Antirrhinum, xiv., 102; xvi., 253, 283.
Antitrichia, xv., 186.
Anychia, xiii., 172, 185
Aphanostemma, xiv., 147; xvi., 44.
Aphantostephus, xi., 128, 129.
Aphyllon, vii., 62, 67; xi., 83; xiv., 220; xvi., 150, 215, 330.
Apieba, xvi., 60, 157.
Apinagia, xvi., 312.
Apios, xi., 116, 117, 123, 125; xiii., 138; xiv., 128, 241; xv., 151, 223.
Apium, vii., 124; xiv., 223; xv., 57.
Aplectrum, vii., 50, 54; x., 121; xi., 134.
Aplopappus, xvi, 283.
Apocynum, vii., 28; xi., 121.
Apogon, xiv., 68.
Apogonia, xvi., 237.
Aponogeton, xiii., 154.
Aplopappus, x., 126; xii, 25.
Aquilegia, vii., 66; ix., 102; x., 107; xi., 83; xii., 25, 57, 58, 101; xiii., 5, 194; xv., 97, 112, 143, 165; xvi., 268.
Arabis, vii., 37, 49; viii., 70; xi., 28, 54, 84; xii., 52; xiii., 6, 60; xiv., 150, 163, 209, 250; xv, 58, 93; xvi., 204.
Aralia, vii., 26, 49, 52; viii., 92; ix, 114; x., 105; xi., 83; xii., 101; xiii., 36, 70, 71, 189; xiv., 154, 166, 186, 233; xv., 58, 132, 325, 326; xvi., 45, 288, 310.
Araucarioxylon, xvi., 173.
Araucaria, viii., 63; xv., 108, 222, xvi., 333.
Arauja, xv., 274.
Arbutus, x., 75; xi., 94; xii., 17, 18, 19; xiii., 208; xvi., 310.
Arceuthobium, ix., 33; x., 62; xvi., 58.
Archangelica, vii., 87; xiii., 246. xv., 56.
Archemora, vii., 87; xiv., 184; xv., 56.
Archidium, vii., 3; xv., 114.
Arctagrostis, ix., 135.
Arctium, xi., 104; xiv., 234 245.
Arctophila, xv., 117.
Arctostaphylos, vii., 14, 19; x., 34, 106; xi., 12, 132; xii., 17, 18, 93; xiii., 12, 123, 220; xiv, 56, 104, 150, 188, 220; xv., 18; xvi., 119, 194, 230.
Ardisia, xiv., 170; xv., 172; xvi., 120.
Arenaria, vii., 19, 57, 82; x., 106, 107; xi., 84, 128; xii., 26, 37, 62; xiii, 6; xiv., 13, 231, 232; xv., 58; xvi., 61., 126, 149, 329.
Arethusa, viii., 23, 99; x., 46; xii., 37; xiii., 5; xv., 133.
Argemone, vii., 123; ix., 156; xii., 48; xiii., 66; xiv., 223; xv., 214.
Argyrothamnia, xvi., 66.
Ariba, xvi., 282.
Arisæma, vii., 74; viii., 115; ix., 90; x., 122; xii., 53, 100; xiii., 177, 192; xiv., 185; xv., 256; xvi., 169.
Aristida, ix., 34, 87, 88, 135; x., 7, 42; xii., 35; xiii, 27, 28, 52, 53.
Aristolochia, vii, 113; ix., 150; xiii., 61, 177; xiv., 68, 77, 88; xvi., 116, 168, 227, 305.
Aristotelia, xvi., 229.
Armeria, xv., 17.
Arnica, vii., 57; xi., 103; xii, 25; xiv., 128.
Arrhenatherum, vii., 12; ix., 135; xiv., 151.
Artemisia, vii., 12, 19; ix., 150, 156; x, 42, 46; xi., 129; xii., 26; xiii., 6, 176, 188, 195; xiv., 230, 234; xv., 328; xvi., 288, 330.
Arthopyrenia, xvi., 87.
Arthonia, xii, 113, 114; xvi., 87, 105, 199.
Arthrociadia, x, 106; xii., 62; xiii, 109.
Arthrociadium, ix., 126, 127.
Arthrodesmus, vii., 47, 91; viii., 40; x., 17; xii., 133; xv., 159; xvi, 187.
Arthronia, xii., 113, 114; xiv., 152.
Arthrosporium, viii., 64.
Arum, ix., 91; xv., 73, 256.
Arundinaria, ix., 135; xiii., 74.
Arundo, ix., 135; x., 8.
Asarum, vii., 27; xiii., 61, 70, 177; xiv., 13, 184.
Asclepias, vii., 27, 82, 98, 114; viii., 5, 87, 108, 130, 132; ix., 56; x., 70, 98, 120, 121, 135; xi., 88, 115; xii., 37, 40, 48, 100, 101; xiii., 60, 70, 95, 225; xiv., 184; xv., 53, 58, 132, 212, 246, 257, 321, 328; xvi., 53, 131.
Ascomyces, viii., 26; 50.
Ascophyllum, xiii., 109; xv., 312.
Ascospora, x., 49.
Ascomycetella, viii., 50, 51.
Ascyrum, vii., 82; ix., 101, 149; xii., 38; xiii., 69, 98.
Aserod, vii., 33.
Asimina, xiii., 70, 174; xiv., 35; xv., 199.
Asparagus, xi., 56; xiii., 39.
Aspergillus, xiv., 252, 264.
Asperococcus, ix., 65.
Asperugo, viii., 141; xi., 46; xii., 39.
Asperula, xii., 39.
Asphodelus, vii., 122.
Aspidium, vii., 25, 26, 61, 62, 64, 85, 86, 93, 97, 113, 121; viii., 4, 60, 89, 94, 99, 105; ix., 5, 21, 22, 50, 68, 69, 129; x., 4, 29, 32, 33, 40, 101, 102, 119; xi., 8, 36, 48, 67; xii., 12, 23, 42, 48, 103, 105; xiii., 35, 63, 71, 73, 74, 81, 117, 128, 134, 223; xiv., 16, 181. 238; xv., 173, 181, 225, 226, 250; xvi., 38, 124, 290.
Asplenium, vii., 15, 24, 26, 28, 29, 34, 60, 69, 85, 94, 95, 96; viii., 79, 94, 100; ix., 12, 20, 21, 50, 68, 83, 100; x., 6, 28, 29, 59, 102; xi., 7, 48, 84; xii., 23, 42, 48; xiii., 49, 52, 70, 73, 82, 117, 130, 192; xiv., 97, 98, 122, 181, 238, 262; xv., 172, 211, 226, 239, 249; xvi,, 206.

Asprella, ix., 134, 135, 137.
Aster, vii., 11, 14, 18, 19, 82, 98, 112, 114, 121; viii., 53, 120; ix., 35, 101; x., 34, 37, 120, 121, 136; xi, 102, 103, 130; xii, 25, 39, 103 116; xiii., 5, 39, 75, 85, 116, 246; xiv., 13, 164, 188, 234; xv., 68, 136, 302; xvi., 36, 38, 60, 67, 118, 123, 132, 133, 163, 227, 252, 280, 286, 268, 305, 329, 340.
Asterina, viii., 91; ix., 29, 74; xv., 274.
Asterolampra, xvi., 73.
Asteromphalus, xiv., 96.
Astilbe, xiii., 74; xv., 98.
Astomum, vii, 8; xv., 114.
Astræus, xvi, 254.
Astragalus, vii., 124; viii., 94, 97; ix., 5, 121; x., 81, 96; xii., 26, 34, 118, xiv., 61, 104, 168, 232, 267; xv, 58, 93, 138, 200, 222, 245; xvi., 70, 203, 204, 229.
Astrophyllum, xvi., 110.
Astrycum, xii., 37.
Atænia, xvi., 176.
Athyrium, (see Asplenium.)
Athysanus, xiii., 218.
Atrichum, xiii., 99; xv, 186; xvi., 110.
Atriplex, vii., 12, 18; viii., 76, 114, 120; x., 121; xi., 58, 104; xii., 40; xiv., 105, 236; xv., 91; xvi., 70, 144.
Atropis, ix., 137; x., 31, 66, 77; xv., 48, 117.
Atropos, xiv., 34.
Atropa, xiv., 62.
Audibertia, xvi., 203.
Aulacomnion, xiv., 132.
Aulacodiscus, xvi., 73, 208.
Aulaxanthus, ix., 134.
Auliscus, xiv., 141, 142; xvi., 71, 73.
Avena, vii., 28. ix., 135, 146; xiii., 99; xv., 294.
Avicennia, xii., 47, 48; xvi., 199.
Avicularia, viii, 99.
Avrainvillea, xvi., 253.
Aydendron, xvi., 282.
Azalea, xi., 11; xiii., 5, 174, 222; xiv., 34; xv., 254.
Azolla, vii., 35, 69; xii., 32; xiii., 81, 102; xiv., 35; xv., 112, 262; xvi., 134.
Bacillaria, xiv., 29, 30, 109; xv., 130, 131; xvi., 103.
Bacillus, xi., 102; xii., 108; xiv., 88; xv., 37.
Bacterium, xi., 102; xiii., 170, 191; xv., 37.
Bæomyces, xv., 184.
Bœria, x., 86; xiv., 16; xv., 112; xvi., 86, 176.
Bahia, xvi., 86, 203, 253.
Balsamorhiza, viii., 81; xi., 49.
Bambusina, ix., 27; xii., 127, 138; xvi., 185.
Bangia, xiii., 109; xv., 312.
Bannisteria, xvi., 158.
Baptisia, viii., 87; xi., 99, 122, 134; xii., 100, 121; xiii., 46, 220; xiv., 24, 68, 77; xv., 214; xvi., 52, 269.
Barbarea, vii., 50; xi., 46; xiv., 79, 245.
Barbiera, xvi., 260.
Barbula, xiv., 23, 88; xv., 185, 186; xvi., 30, 92, 94, 107, 249, 307.
Barnardesia, xvi., 139.
Bartonia. x., 67; xiv., 36.
Bartramia, xvi., 110, 225.
Basella, xiv., 127.
Basidiobolus, xv., 171.
Bassoria, xi., 82.
Batatas, ix., 130.
Batrachospermum, vii., 48; ix., 29; x., 55; xv., 156; xvi., 182.
Bauhinia, xiii., 36, 37, 77, 78, 88; xiv., 164; xv., 115. xvi., 326.
Bebbia, xiii, 42, 46.
Beckmannia, ix., 134, 136; x., 8, 63; xvi., 231.
Begglatoa, xii., 129; xiii., 105.
Begonia, xv., 93, 182; xvi., 218.
Behria, xiv., 15.
Belamcanda, xv., 235.
Bellis, viii., 9; xvi., 150.
Beloperone, xv., 172.
Belvalia, xiii., 159.
Berberis, ix., 156; x., 123; xi., 90; xii., 101; xiii., 47, 83, 188, 233; xiv, 162; xv., 18, 105, 106, 107, 246; xvi., 15, 30, 242.
Berchtoldia, ix., 134, 136.
Berkleya, xiv., 29, 30; xv., 130, 131.
Berteroa, xi., 94.
Bertholetia, xvi., 180.
Betula, vii, 24, 54; ix., 36; x., 33; xi., 99; xii., 24, 40 82, 100; xiii., 209, 233, 244; xiv., 236, 252; xvi, 133, 286, 289, 311.
Betulites, xvi, 284.
Biatora, xvi., 330.
Bibliarium, xiii, 124.
Bidduiphia, xiv., 30, 141; xv., 130, 131; xvi., 71, 73, 208.
Bidens, vii., 19; x., 46; xii., 48; xiii; 30, 60, 227; xiv., 67, 68, 164, 227; xvi., 288.
Bigelovia, ix., 62, 156; x., 126; xi., 128, 129; xiv., 150, 227.
Bignonia, xiv., 108; xv, 203; xvi, 280.
Billbergia, xiii., 139; xvi., 306.
Bixa, xvi., 19.
Blakea, xvi., 120.
Blechnum, viii., 79; xiv., 147, 148, 249; xv., 43, 249.
Blephara, xiv., 257.
Blepharidachne, xv., 117.
Blepharipappus, xv., 148.
Blepharizonia, xiii., 43.
Blephilia, xiii., 116; xiv., 200; xvi., 136.
Blindia, xiv., 23.
Blitum, vii., 18, 19; xv., 132.
Blumenbachia, ix., 135.
Blysmus, xvi., 83.
Bocagea, xvi., 14.
Bocconia, xvi., 15.
Bœhmeria, xiv., 66; xvi., 21, 70.
Bœrhaavia, x., 81; xvi., 86, 174.

Bolbitius, xiii., 127.
Boletinus, xvi., 333.
Boletus, vii., 93, 113; viii., 15, 34, 57; x., 73; xii., 33; xiii., 175; xiv., 126, 244; xv., 91; xvi., 333.
Boltonia, xi., 103.
Bombax, xvi., 154.
Bombus, viii., 68, 135.
Borrago, vii., 125.
Borrichia, xv., 325.
Bosselinia, xi., 74.
Bostrychia, xiii., 114; xv., 310, 313.
Botrychium, vii., 23, 85, 97, 114, 115; viii., 47, 60, 79, 93, 100, 101; ix., 23, 68, 91, 100, 116; x., 4, 7, 67, 105; xi., 7, 8, 75, 140; xii., 29, 23, 53, 110; xiii., 63, 74, 81, 84; xiv., 88, 238; xv., 87; xvi., 206.
Bougainvillea, xvi., 174.
Bouteloua, ix., 135, 137, 147; x., 96; xi., 5, 6, 45, 133; xiii., 39, 249; xiv., 9; xv., 49; xvi., 173.
Bouvardia, xiv., 87.
Brachychæta, xiii., 85.
Brachyelytrum, vii., 114; ix., 135; xvi., 290.
Brachyphyllum, vii., 76; xiii., 35, 36.
Brasenia, vii., 28, 29; x., 9; xi., 90, 140; xii., 32; xiv., 44, 210; xv., 29; xvi., 287.
Brassica, vii., 122, 123; ix., 149; xv., 325; xvi., 34, 44.
Braunia, xvi., 109.
Breweria, x., 81.
Brickellia, viii., 75; x., 80; xi., 128, 130; xii., 35; xvi., 84.
Briza, viii., 59; ix., 135; xiv., 148
Brizopyrum, ix., 137; x., 31, 65.
Brodiæa, viii., 81; xi., 68; xii., 17; xiii., 44, 248; xiv., 15; xv., 144, 199, 200; xvi., 200.
Bromelia, ix., 60.
Bromus, vii., 19, 27; viii., 7, 28; ix., 23, 135, 137, 151; x., 31, 32, 78; xi., 92; xii., 25; xiv., 98, 151; xv., 9, 48; xvi., 46, 290.
Browneа, xvi., 84.
Bruchia, vii., 3, 4, 15; xv., 114.
Brugmansia, viii., 69; xiii., 37.
Brunella, xii., 59; xiii., 5, 189; xiv., 235; xvi., 289.
Brunellia, xvi., 160.
Brunfelsia, xi., 82; xiii., 238.
Bryonia, xi., 36.
Bryophyllum, xii., 48.
Bryopsis, xi., 30; xiii., 107; xv., 140, 141, 311.
Bryum, xv., 185, 186; xvi., 95, 110, 120, 307, 340.
Buphthalmum, vii., 124.
Buchloe, ix., 135; xiii., 249; xv., 215; xvi., 173.
Buckleya, xiv., 206.
Buda, xvi., 126.
Buddleia, xvi., 46.
Buellia, xiv., 134, 152; xvi., 87, 199.
Buettneria, xvi., 155.
Bulbochæte, vii., 48; viii., 40; x., 14; xv., 156.
Bulbocoleon, xiii., 107.
Bumelia, x., 90, 91.
Bunchosia, xvi., 158.
Bupleurum, vii., 87; viii., 142.
Burshia (Purshia), xii., 37.
Buxbaumia, ix., 24; xiii., 244; xiv., 12, 132; xvi., 110.
Buxus, xiii., 202; xiv., 264.
Byrsonima, xvi., 157.
Byssocaulon, xvi., 87.
Cacalia, viii, 115; xiii., 75; xv., 299.
Cactus, xii., 50, 60, 133; xiii., 183; xv., 128.
Cælastrum, vii., 44; viii., 39.
Cæleosphærium, xiii., 93.
Cæoma: x., 62; xi., 50.
Cælopleurum, xv., 56, 224.
Cæsalpinia, xvi., 325, 333.
Cajanus, xvi., 324.
Cakile, vii, 19; viii., 71; x., 46; xii., 48; xiii., 246; xiv, 231; xv., 136.
Calais, xiii., 66; xiv., 16, 104.
Calamagrostis, vii., 12, 19; viii., 23; ix., 136, 145; x., 8, 64; xi., 7; xv., 117.
Calamodendron, xiii., 68.
Calamus, xv., 176.
Calandrinia, xiv., 101; xv., 200; xvi., 56, 169.
Calamintha, vii., 18; viii., 22; xiii., 70; xiv., 262; xvi., 247, 289.
Calceolaria, xiii., 8, 9; xv., 17, 105.
Calcisphæra, xvi., 172.
Calea, xvi., 33.
Calendula, xi., 35, 136.
Caliciopsis, ix., 61.
Calicium, ix., 62; xiv., 248; xvi., 29.
Calla, viii., 92; xv., 133.
Calliandra, xvi., 327.
Callirhoe, xii., 62; xv., 214.
Callithamnion, ix., 68; x., 56; xi., 29; xiii., 110; xv., 312.
Callitriche, ix., 24, 150; x., 121; xiii., 7, 83; xv., 258, 327.
Callophyllis, xv., 19, 112.
Calloria, x, 49.
Calochortus, viii., 76; x., 81; xiii., 174; xiv., 239; xv., 94, 112, 139, 200; 219, 299; xvi., 56.
Calluna, xi., 132; xiii., 12, 204, 227, 246; xiv., 11; xv., 245; xvi., 33.
Calocylindrus, viii., 39; xi, 15; xvi., 185.
Calopogon, vii., 12, 54; x, 67; xi., 134; xiii., 5; xv., 53, 183, 243.
Calopogonium, xvi., 262.
Calosiphonia, xvi., 3.
Calostoma, xv., 296.
Calotheca, xiii., 148.
Calothrix, viii., 38, 39; ix., 25, 68; x., 20, 55; xi., 130; xiii, 105; xv., 310.
Caltha, xiii., 248; xv., 19, 214.
Calycadenia, ix., 109, 110.
Calycanthus, xi., 89; xv., 28, 58, 96, 199, 205.
Calypso, xiv., 153; xvi., 203.

Calyptridium, xiii., 144; xiv., 101, 196; xvi., 148.
Calyptrospora, viii., 86.
Calystegia, x., 97; xi., 127; xiii., 95; xv., 132.
Camassia, xiii., 115; xiv, 169, 241; xv., 199, 219.
Camelina, vii., 11; xvi., 38, 287.
Camellia, xiv., 32.
Campanula, vii., 113; viii., 8, 46; xi., 9; xii, 39, 100, 107, 109; xiii., 6, 60, 70, 71, 83, 116, 175, 189, 192; xiv., 137, 138, 185, 230, 234; xv., 132, 299; xvi., 271, 273.
Campilodiscus, xiv., 30.
Camptopteris, vii., 76; xi., 8.
Camptosorus, vii, 15, 26, 29, 85, 96; viii., 47, 100, 101; ix., 12, 21, 116; xii., 53; xiii., 61, 117; xiv., 181.
Camptothecium, xv., 243; xvi., 226.
Campylopus, xiv., 148; xv., 243.
Campylodiscus, xiv., 141, 175.
Canavalia, xi., 125; xii., 118; xvi., 324.
Cannabis, ix., 150; xi., 58; xii, 87.
Canotia, ix., 106; xii, 50; xiii, 183.
Cantharellus, vii., 34; viii., 56; xiii, 175; xv., 91.
Capparis, viii., 120; xvi., 17, 200.
Caprifolium, xv., 128.
Capsella, xii., 103; xiii, 99, 189; xiv., 124, 245; xv., 135; xvi., 16, 44.
Capsicarpella, ix., 67.
Capsicum, xv., 108, 133, 255.
Capunia, xvi., 191.
Caraipa, xiv., 263.
Caragnata, xvi., 168.
Cardamine, vii., 57, 99; viii., 98; x., 9; xii., 52, 101, 151; xiv., 104, 150, 168; xv., 93; xvi, 15.
Cardiospermum, x., 123; xvi, 190.
Carduus, vii., 125; xi., 139.
Carex, vii, 12, 18, 19, 38, 88, 116, 125; viii, 6, 22, 28, 29, 35, 77, 93; ix, 5, 35, 36, 72, 82, 84, 151; x., 9, 67, 77, 108; xi., 19, 52, 53, 83, 92; xii., 40, 55; xiii., 71, 72, 84, 97, 128; xiv., 16, 17, 35, 36, 159, 167, 237, 246, 262; xv., 144, 297, 323; xvi., 38, 70, 83, 90, 134, 176, 200, 218, 264, 329, 334.
Carica, xii., 47, 122; xv., 55; xvi, 46.
Carludovicia, xvi., 334.
Carpanthus, xii, 37.
Carpenteria, xiii., 85, 174; xiv., 19, 59, 196; xv., 259; xvi, 253.
Carphochæta, xii., 17.
Carpinus, viii., 144; ix,, 19; x., 89; xii., 89; xiii., 116; xv, 265; xvi., 105.
Carthamus, ix., 142.
Carum, vii., 87; ix., 150; xiii., 95.
Carya, vii., 21, 22, 54; viii., 60, 91, 132; xi., 33, 69, 70; xii., 75, 82, 102, 124; xiii., 31, 178, 228; xv., 170, 280; xvi., 169, 311.
Caryocar, xvi., 63.
Caryochloa, ix., 154.
Casalea, xiv., 147.
Cassandra, x., 9; xi., 106; xii., 17, 19; xiv., 188, 230, 235; xv., 200; xvi, 289.
Cassia, vii, 113; viii, 103, 104, 115, 120; ix., 114; xii., 100; xiii., 177, 249; xvi., 170, 325.
Cassine, xvi., 202.
Cassiope, xii., 11, 17, 19.
Castagnea, xi., 30; xiii., 109; xvi., 10.
Castalia, xiv., 178, 257; xv., 51, 84, 164, 200, 235, 299; xvi., 117, 169, 228, 287, 338.
Castanea, vii.; 81, 107, 121; viii, 60, 91; xi., 69; xiii., 174, 209; xiv., 95, 247; xv., 306; xvi., 311.
Castanopsis, xi., 24.
Casteria, x., 60.
Castilleia, vii., 19; xi., 84; xii., 25; xiv., 40, 68, 102, 105, 235; xv., 132, 214; xvi., 208.
Catabrosa, ix., 135, 137.
Catalpa, vii., 22; xi., 84, 125; xiii., 46, xv., 200; xvi., 56, 227, 280, 307.
Catharinea, xvi., 110, 124.
Cathedra, xvi, 168.
Cathestechum, xi., 37; xiv., 100.
Cattleya, xvi., 227, 253.
Catopsis, xvi., 168, 306.
Caucalis, viii., 142.
Caulanthus, xv., 200.
Caulerpa, xv., 140.
Caulinia, xiii., 160, 161.
Caulinites, xiv., 171.
Caulophyllum, xiii., 60, 83; xiv, 130, 139, 140, 240, 258.
Caulopteris, xvi., 336.
Ceanothus, xiv., 15; xv., 58, 93, 297; xvi., 84, 148, 200, 205, 232, 281, 340.
Cecidomyia, xvi., 23.
Cecropia, xv, 195.
Celastrophyllum, xiii., 36.
Celastrus, viii., 120; xi., 36; xii., 82; xiii, 36, 148, 196; xv., 55, 200; xvi., 244.
Cedronella, xv., 93, 94, 138.
Celdemia, xvi., 120.
Celsia, xiii., 239.
Celtis, ix., 54; x., 123; xi., 93; xiii., 6; xiv., 162.
Cenangium, ix., 7, 8, 62; x., 76.
Cenchrus, vii., 28; ix., 77, 134; xvi., 59, 145.
Centropogon, xvi, 281.
Centaurea, vii., 69, 124; viii., 75, 142; ix., 23; x., 108; xi, 35, 103; xii., 39, 116; xiii., 5, 83; xiv., 163.
Centrosema, xvi., 262.
Centunculus, xiv., 147.
Cephælis, xv., 128.
Cephalanthus, xi., 115, 121; xv., 54.
Cephalosporium, xvi, 172.
Ceramium, xiii., 111; xv., 19, 112, 313.
Cerastium, vii., 1, 13, 14, 123; viii., 108; xi., 83; xii, 25, 48, 103; xiv., 24, 45, 68, 147, 186, 231; xv., 17, 97; xvi., 44, 45, 51, 61, 242.
Cerataulus, xvi., 208.
Ceratochloa, ix., 137; x., 31.

Ceratophorum, xvi., 196.
Ceratopteris, viii., 79, 94.
Ceratostoma, ix., 90.
Cercidium, xvi., 310.
Cercis, xi., 122, 123; xiii., 31, 36, 69, 77, 117; xiv., 168.
Cercocarpus, ix., 156.
Cercospora, viii., 27. 65; x., 50; xi., 115, 116, 121, 122; xiv., 60, 78, 209, 245; xv., 54, 56; xvi., 196, 231.
Cereus, vii., 101; viii., 92; x., 60; xi., 135, 136, 139; xii., 75; xiii., 146; xiv;, 200, 241; xv., 128, 179; xvi., 85, 170.
Cerinthe, xi., 35.
Cerophora, xii., 37.
Cestodiscus, xvi, 209.
Cestrum, xi., 82; xiv., 44, 87, 159; xvi., 45.
Cetraria, xiii., 149; xiv., 63, 222; xvi., 199.
Chænactis, ix., 5, 17; xi., 67; xiv., 218, 219; xvi., 253.
Chærophyllum, vii., 87, 124; x., 70; xiv.; 260; xv., 57.
Chætium, ix, 134, 136.
Chætocalyx, xvi., 260.
Chætoceros, xvi., 209.
Chætomella, ix., 133.
Chætomorpha, x., 102; xi., 130; xiii., 106; xv., 311.
Chætophora, xi, 130; xiii., 93; xiv., 65.
Chamæcyparis, x., 47; xi., 23; xii., 76; xiii., 150; xiv., 220, 247; xvi., 311.
Chamælirium, vii., 26, 113; xii, 101; xiii., 84; xv., 133; xvi., 134.
Chamæphœnix, xiv., 79.
Chamæraphis, x., 85.
Chamæsaracha, ix., 122.
Champia, xi., 29, 30; xiii., 112; xiv., 210, 240; xv., 313.
Chantransia, vii., 48.
Chapmannia, viii., 119.
Chara, vii., 106, 107; viii., 21; ix., 34, 37, 60; xiv., 213; xv., 91, 222; xvi., 170, 172.
Cheilanthes, vii., 16 26, 27, 50, 63, 72, 85, 86, 114; viii., 32, 36, 61, 89, 116; ix., 21, 22, 69, 92; x., 28, 61, 62; xi., 48; xii., 21, 22; xiii., 82, 130, 131; xiv., 168, 221; xv., 211, 212, 225, 227, 228, 249.
Cheiranthodendron, xiv., 102.
Cheiranthus, ix., 117; x, 74; xiii., 143; xv., 200; xvi., 84.
Cheirostemon, xii., 95.
Chelidonium, xii., 90, 101; xiii, 115; xiv, 245.
Chelone, xiii., 47, 72, 73, 234, 238, 239; xiv., 235.
Chenopodium, viii., 142; ix., 156; xiii., 188, 189 246; xiv., 13, 14, 127, 147, 245, 250; xv., 223 xvi., 144, 145, 169, 289.
Chevreulia, xiv., 159.
Chilobothrium, xv., 18, 105.
Chilopsis, ix., 54.
Chimaphila, vii., 19; xii., 16, 17, 20, 53; xiv., 186, 235; xv., 128; xvi., 289.
Chiodecton, xii., 69.
Chiogenes, ix., 6; x., 67; xii., 103; xiii., 189; xv., 128, 186, 245; xvi., 263.
Chionanthes, xi., 32, 89; xiii., 175; xiv., 192, 260.
Chionophylla, xv., 144.
Chironia (Sabbatia), xii., 37.
Chitonia, xvi., 56.
Chlamidococcus, xii., 131.
Chloridiopsis, ix., 146; x., 8.
Chloris, ix., 135, 136, 146, 147; xii., 48.
Chlorococcus, xiii., 93.
Chlorogalum, xiv., 241.
Chloropsis, ix., 136, 146.
Chondrilla, xv., 246.
Chondriopsis, xi., 29; xiii., 113; xv., 314.
Chondrites, xiii., 35.
Chondrosium, ix, 147; xi, 133.
Chondrodendron, xvi., 16.
Chondrus, xiii., 112; xv., 313.
Chorda, x, 55; xiii., 109.
Chordaria, xiii., 108; xv., 312; xvi., 11.
Choreocolax, xvi., 6.
Chorisia, xvi., 154.
Chorizanthe, xiii., 42, 123, 250; xvi., 85.
Christophoriana, xv., 126.
Chroococcus, xi., 101, 102.
Chroolepus, viii., 39.
Chrysanthemum, vii., 17; viii., 84; xi., 67, 103; xii., 39, 124; xiv., 230, 234, 245; xvi., 89, 288.
Chrysobalanus, xiii., 176.
Chrysochlamys, xv., 115; xvi., 63.
Chrysomyxa, xi., 65; xii., 12.
Chrysopogon, ix., 135, 136; xiii., 249; xv., 117; xvi., 240.
Chrysopsis, vii., 89, 98; viii., 75; xiii., 5, 47, 69, 75.
Chrysosplenium, ix., 36; x., 67.
Chrysostigma, viii., 38.
Chrysurus, ix., 135.
Chrysymenia, xvi., 1.
Cicer, xiv., 86.
Cichorium, x., 9; xii., 48, 53, 101; xiii., 60.
Cicuta, vii., 11, 21, 87; xi., 90; xiv., 127; xv., 135; xvi., 230, 288, 335.
Cimicifuga, xiii, 8, 43, 72; xv., 126.
Cinchona, xiv., 210; xv., 53, 178.
Cinclidotus, xvi., 93.
Cinclidium, xv., 201.
Cincraria, xv., 236.
Cinna, ix., 135, 136; x., 64; xi., 138, xvi., 238.
Cinnamomum, xiii., 36, 37; xv., 95.
Cintractia, xii, 69, 70; xiv., 208.
Circæa, xii., 103; xiii., 73; xiv., 233.
Cirsium, viii., 46; ix., 11, 56, 141; x., 36, 54, 120; xi., 102, 103, 104; xii., 103, 111; xiii., 188.
Cissampelos, xvi., 15.
Cissites, xiii., 36; xiv., 172.
Citrus, xiv., 264; xv., 221; xvi., 77.

Cladium, vii., 12; viii., 29, 120; x., 121.
Cladonia, xiii., 30, 149; xiv., 248; xv., 112, 184; xvi., 27, 166, 249.
Cladophora, xii., 126; xiii., 93, 105; xv., 19, 311.
Cladosiphon, xvi., 10.
Cladosporium, xiv., 245, 260; xvi., 201, 225, 231.
Cladostephus, xiii., 108.
Cladothrix, vii., 125.
Cladrastis, xvi., 310.
Clarkia, xi., 49. xv., 25.
Clathrocystis, vii., 100; xv., 310.
Clathropteris, vii., 76.
Clathrus, vii., 11, 30, 31; viii., 96.
Claudopus, xiv., 244.
Clavaria, xii., 37; xiii., 175; xiv., 244; xvi., 118, 201.
Claviceps, xiv., 151.
Claytonia, ix., 10, 149; xi., 36, 105; xii., 100; xiv., 68, 101; xv., 59; xvi., 146.
Clematis, vii., 14, 26; viii., 108; ix., 125, 156; x., 72, 82; xi., 83; xii., 25; xiii., 60, 115, 238; xiv., 84, 147, 154, 176; xv., 135; xvi., 32, 132, 287.
Cleome, viii., 120; ix., 156; x., 33; xv., 239; xvi., 17.
Cleomella, xiv., 223.
Clethra, ix., 23; xi., 18; xiii., 192; xiv., 221.
Clethria, vii., 30.
Clicotybe, xvi., 202.
Clevelandia, xiii., 43.
Clibadium, xvi., 120.
Cliftonia, xiv., 167; xvi., 309, 310.
Climacium, xvi., 111.
Clintonia, viii., 92, 120; ix., 114; x., 44, 106; xii., 104; xiii., 43; xiv., 237; xvi., 290.
Clitoria, xvi., 262.
Closterium, vii., 44, 84; viii., 39; ix., 26; x., 15; xii., 1, 2; xiii., 93, 94; xv., 158; xvi., 25, 118, 185.
Clusia, x., 10; xvi., 62.
Cnicus, x., 107; xi., 91, 102, 103, 104; xii., 26, 124; xiii., 246; xiv., 14, 16, 128, 150, 151, 186, 196, 234, 245, 262, 268; xv., 57, 82, 115, 136; xvi., 70, 145, 150, 288.
Cobæa, vii., 83, 84; ix., 117; xv., 172.
Coccocarpia, xiv., 222.
Cocconema, xv., 183; xvi., 74.
Cocconeis, xiv., 27, 30; xv., 130, 131, 183.
Cocculus, x., 136; xii., 56.
Cochlearia, xv., 223.
Cocos, xiv., 268; xvi., 307, 335.
Codiolum, x., 55.
Codium, xv., 19, 142.
Cœlestina, vii., 112.
Cœlosphærium, vii., 100; viii., 67.
Cœnogonium, ix., 33; xv., 184.
Coix, ix., 134.
Coleanthus, ix., 135.
Coleochæte, vii., 48; xiii., 94.
Coleosporium, viii., 29; xi., 65.
Collæa, xvi., 262.
Collas, xvi., 217.
Collema, xvi., 28.
Collinsia, xiv., 192; xvi., 86.
Collinsonia, x., 33; xii., 63; xiii., 61.
Collomia, viii., 75. xv., 25, 299.
Collybia, viii., 57.
Colocasia, xiv., 126; xvi., 171.
Cologania, xvi., 262.
Colonnaria, vii., 30; xii, 37, 38.
Coloptera, xvi., 122.
Colpodium, xv., 117.
Colus, viii., 96.
Colutea, viii., 142; xii., 118.
Comandra, vii., 67; x., 37; xi., 49, 50, 110, 112; xiv., 206.
Comarostaphylos, xiv., 150.
Comarum, xiii., 233.
Commelina, vii., 114; viii., 120; xii., 48.
Compsopogon, xv., 326.
Comptonia, ix., 19; xi., 99; xii., 93.
Conferva, vii., 47; viii., 40; xiii., 93; xvi 182.
Conioselinum, vii., 87; xiv., 233.
Coniothyrium, xiv., 244.
Conium, vii., 17, 87; viii., 9; xiii., 188; xiv., 147; xvi., 44, 230.
Connarus, xvi., 192.
Conoclinium, xi., 104; xiii., 115.
Conomitrium, xiii., 11; xvi., 107.
Conopholis, vii., 27.
Conostegia, xvi., 168.
Conradina, xv., 191.
Convallaria, ix., 120; xi., 36; xv., 286.
Convolvulus, vii., 128; viii., 119, 120; ix., 130; xiii., 117, 246; xiv., 150, 159.
Copaifera, xvi., 326.
Copernicia, vii., 101; xvi., 335.
Coprinus, viii., 57, 67; xi., 70; xiii., 175.
Coptis, viii., 92; xi., 36; xii., 72, 73, 100, 103; xiv., 178; xv., 127, 133; xvi., 287.
Cora, xiv., 222; xv., 184.
Corallina, x., 56; xiii., 114; xv., 183.
Corallorrhiza, vii., 28, 98; xii., 53; xiii., 85; xv., 133, 243, 254; xvi., 265
Corchorus, xiii., 338; xvi., 156.
Cordia, xvi., 172.
Corema, ix., 83, 119; x., 89; xi., 97, 98, 99, 100, 101, 116, 127, 132, 139; xii., 10, 93, 94; xiii., 12, 220; xiv., 11, 154, 187; xv., 245; xvi., 193, 200, 281, 295.
Coreopsis, vii., 82, 98; x., 46; xi., 103, 104, 128, 129; xiii., 31, 70, 75, 83, 124; xiv., 13, 219; xvi., 70, 227.
Corethrogyne, x., 41; xiv., 104.
Corethron, xiv., 175.
Coriandrum, vii., 11.
Corispermum, xv., 94.
Cornus, vii., 1, 13, 28, 121; viii., 130, 144; ix., 134; x., 44, 105; xi., 36, 100, 132; xii., 12; xiii., 36, 73, 116, 189; xiv., 230, 233; xvi., 52.

56, 179, 263, 265, 288.
Coronilla, vii., 11; ix., 120.
Corrigiola, vii., 123.
Corticium, viii., 64.
Corydalis, vii., 24; x., 121; xi., 65; xii., 59, 60; xiii., 6, 71, 94, 175; xv., 127, 220; xvi., 172, 244, 268, 287, 293.
Corylus, vii., 25, 26, 28; x., 71; xi., 70, 114; xii., 114; xiii., 233; xiv., 236; xvi., 289.
Coryneum, ix., 134; xi., 33, 34.
Corynites, vii., 9, 11, 30; viii., 95, 96; xii., 37; xv., 314.
Corythea, xiv., 168.
Coscinaria, xiii., 176.
Coscinodiscus, xiv., 30, 175; xv., 130, 131; xvi., 74.
Coscinodon, xvi., 109.
Cosmarium, vii., 45; viii., 1, 39; ix., 26; x., 16; xi., 13, 14, 16; xii., 2, 3, 51, 127, 133; xiii., 57, 58, 59, 93; xv., 158; xvi., 118, 186.
Cottea, ix., 135; x., 29.
Cotula, vii., 35; xiv., 146.
Cotyledon, x., 125; xvi., 176.
Coursetia, xvi., 260.
Cowania, xii., 56.
Cracca, xvi., 260.
Crantzia, vii., 87; x., 102; xii., 87; xvi., 52.
Craspedodiscus, xvi., 72, 94.
Cratægus, vii., 72, 82, 120, 121; viii., 72; ix., 4; xi., 106; xiii., 72, 76, 94; xiv., 88, 172; xv., 135; xvi., 132, 281, 310.
Craterellus, xv., 91.
Cratylia, xvi., 324
Credneria, xiii., 38
Cremalobus, xvi., 17.
Crenothrix, xvi., 88.
Crepidotus, xiv., 244.
Crepis, viii., 75, 81; ix., 64; xvi., 314.
Crescentia, xii., 47.
Crinum, xv., 273.
Crocus, xiv., 64.
Crotalaria, vii., 20; viii., 120; xvi., 192.
Croton, vii., 105; ix., 150; x., 35; xii., 115; xvi., 66.
Cryphæa, vii., 6.
Crypsis, ix., 136.
Cryptangium, xvi., 83.
Cryptanthe, xv., 20, 93; xvi., 144.
Cryptogramme, ix., 68.
Cryptopleura, x., 88.
Cryptosporium, ix., 74.
Cryptotænia, vii., 87.
Ctenium, ix., 135.
Ctenomys, xv., 18.
Cucurbita, ix., 30; x., 50, xiii., 14, 66; xiv., 86; xv., 24, 117; xvi., 200.
Cucurbitaria, viii., 125; x., 53, 89; xv., 54.
Cunila, xiii., 116.
Cunninghamites, xiii., 35, 36.
Cuphea, xiii., 5, 69; xiv., 34, 164; xv., 25; xvi., 201.
Cupressus, vii., 82, 98; viii., 23, 72, 86; ix., 64, 79; x., 121; xi., 90, 130; xii., 66; xiii., 193; xiv., 151; xvi., 13, 311.
Cuscuta, ix., 150; xi., 40; xii., 107, 108; xiii., 10, 15, 41, 75, 76, 227; xiv., 13; xv., 172, 201; xvi., 24, 118.
Cyamus, xiv., 215.
Cyanoderma, xv., 25.
Cyathea, xv., 248.
Cycadeospermum, xiv., 171.
Cycadinocarpus, xvi., 228.
Cycas, xii., 47; xiv., 250.
Cycloloma, x., 102; xvi., 59, 70.
Cyclophora, xiv., 175.
Cyclotella, xv., 131; xvi., 209.
Cydonia, vii., 25.
Cylindrocolla, xv., 54.
Cylindrolepis, xvi., 278.
Cylindrospermum, xiii., 93.
Cylindrosporium, xiii., 147; xv., 54.
Cymatopleura, xvi., 74.
Cymbella, xv., 183; xvi., 103.
Cymbopogon, xvi., 241.
Cymodocea, xiii., 162.
Cymopterus, xvi., 122.
Cynaria, xiv., 163.
Cynanchum, ix., 115.
Cynoglossum, vii., 27; ix., 150; xi., 9; xiii., 195; xiv., 186; xvi., 52, 133.
Cynoctomum, ix., 115.
Cynodon, ix., 135; xiii., 101; xiv., 151.
Cynophallus, vii., 10, 11, 30, 32; viii., 96.
Cynosurus, viii., 35; ix., 135.
Cynthia, vii., 27; xi., 104.
Cyperus, vii., 12, 19, 48, 82, 93, 125; viii., 120; x., 32; xi., 29, 85, 86, 87, 95, 96, 120; xii., 7, 8, 32, 69; xiii., 71, 84, 85, 205; xiv., 55, 82, 87, 100; xiv., 205, 208; xv., 98, 246, 296; xvi., 57, 83, 278.
Cyphomandra, xi., 82.
Cyprella, xiv., 159.
Cypripedium, vii., 49, 54, 121; viii., 46, 84, 117, 118, 130; x., 67, 135; xi., 134; xii., 28, 29, 54, 100; xiii., 5, 96, 196; xiv., 62, 128, 153, 193; xv., 17, 58, 133, 136, 171, 200, 204, 219, 240, 243.
Cysticapnos, xv., 127.
Cystoclonium, xiii., 112; xv., 313.
Cystopteris, vii., 18, 85, 112; viii., 4, 46; x., 59, 121; xi., 8; xiii., 70, 71; xiv., 153, 221, 238; xv., 107, 248; xvi., 134.
Cystopus, xiii., 99.
Cytispora, x., 89.
Cytissus, xii., 38.
Dacrymyces, vii., 84, xiii., 176.
Dactylis, ix., 135; xiii., 187.
Dadoxylon, xvi., 336.
Dactyloctenium, ix., 137; xv., 117.
Dædalea, x., 73.
Dahlia, xi., 35; xv., 93; xvi., 307.

Dalbergia, xvi., 324.
Dalea, ix., 5; xi., 104; xv., 93; xvi., 173, 259.
Dalechampsia, xi., 82.
Dalibarda, x., 46, 67; xvi., 263.
Dallingeria, xiii., 102.
Dammara, xiii., 36.
Danthonia, vii., 73; ix., 135, 146; x., 52, 65; xii., 25; xiii., 72, 73; xvi., 290.
Daphnopsis, xvi., 120.
Darbya, xiv., 206.
Darlingtonia, vii, 59; viii., 142; xiii., 248.
Dasya, viii., 107; xi., 29, 30, 131; xiii., 114, xv., 314.
Dasycladus, xv., 142.
Dasylirion, x., 123; xiv., 201, 241; xvi., 335.
Datura, xii., 100; xiii., 5; xiv., 147, 244; xvi., 269.
Daucus, vii., 87; x., 33; xiii., 188; xv., 246.
Davallia, xv., 248.
Davilla, xvi., 13.
Delleseria, xiii., 112, 123; xv., 19, 313.
Delphinium, viii., 81; ix., 142; xi., 36, 67; xii., 25, 38; xiii, 31, 115, xiv., 78, 178; xv., 171, 200; xvi., 176, 228.
Dendrodochium, xi., 50.
Dendromecon, x., 81; xiii., 216; xvi., 56.
Dendrophoma, xiv., 244.
Dendrophycus, xvi., 228.
Dendryphium, viii., 27.
Dentaria, vii., 51, 52; viii., 81; ix., 133, 149; x., 9; xiii., 114, 151; xiv., 13, 150; xv., 257.
Derbesia, xv., 140, 141.
Dermatea, ix., 7.
Dermatiscum, xiv., 134, 222, 248; xvi, 199.
Dermatocarpon, xi., 26.
Derris, xvi., 325.
Deschampsia, ix., 135, 136, 146; x., 64; xiii., 42; xv., 48; xvi., 290.
Desfontainea, xv., 108, 178.
Desmanthus, vii., 124; viii., 142; xvi., 320.
Desmarestia, xi., 131; xiii., 107.
Desmidium, xi., 15; xii., 1; xiii., 58, 93; xv., 158; xvi., 185, 333.
Desmodium, vii., 11, 18, 52, 82, 121; viii., 12; ix., 149; x., 90; xi., 191; xiii., 223; xvi., 51, 261.
Deutzia, xiii, 238; xvi., 314.
Dewalquea, xiii., 36.
Deweya, xvi., 122.
Deyeuxia, ix., 135, 136, 145, 146; x., 8, 64; xii., 25; xiii., 56, 176; xiv., 237; xv., 9, 48, 117, 297; xvi., 35, 206.
Dianthera, xiii., 117.
Dianthus, vii., 123; xvi., 22.
Diaporthe, ix., 19; x., 49, 89, 98; xiv., 244.
Diarrhena, ix., 135.
Diastemanthe, ix., 135.
Diatrype, viii., 74; ix., 19; xiii., 176.
Dicentra, viii., 68, 84; ix., 24, 47, 90; xi., 55, 65, 66, 67; xii., 100; xiii., 70, 71, 114; xiv., 126; xv., 127, 266; xvi., 124, 139.
Dichelyma, viii., 46; xvi., 97, 111.
Dichodontium, xv., 186; xvi., 106.
Dichondra, vii., 125; xii., 48.
Dichonema, xiv., 222.
Dichostylis, xvi., 83.
Dichromena, ix., 86; xi., 87; xii., 48; xv., 100, 101; xvi., 57.
Dicksonia, vii., 85; x., 6; xi., 8; xiii., 35, 73; xv., 248.
Dicladia, xvi., 74.
Diclidiptera, xi., 104.
Diclytra, xvi., 228.
Dicranella, xv., 185, 243; xvi., 30, 91, 107, 248, 249, 250.
Dicranum, xv., 185, 186; xvi., 92, 107, 141.
Dictamnus, xiv., 86.
Dictyoloma, xvi., 160.
Dictyophallus, viii., 96.
Dictyosiphon, xi., 30; xiii., 107; xv., 311; xvi., 11.
Dictyosphærium, vii., 44; xii., 126; xv., 157; xvi., 183.
Didymochlæna, xv., 250.
Diervilla, xiii., 189; xiv., 234; xv., 128, 240; xvi., 247, 288.
Digitalis, vii., 125; xi., 35; xiii., 234, 238, 239.
Dimeregramma, xiv., 30; xvi., 71, 74.
Dimeresia, xiii., 45, 46, 96.
Dimerosporium, xv., 274.
Dimorphococcus, ix., 25.
Dinebra, ix., 147; xi., 133.
Dinemasporium, ix., 20.
Diocleа, x., 133; xii., 32, 118; xvi., 324.
Diodia, xi., 103.
Dionæa, ix., 115, 142; xvi., 118, 253.
Dioonites, xii., 91.
Diorchidium, xvi., 253.
Dioscorea, vii., 71; xiv., 185.
Diospyros, ix., 24; x., 95; xiii., 36; xiv., 268; xv., 28; xvi., 59.
Diphryllum, xii., 37.
Diphylleia, xiii., 74, 75; xiv., 169.
Diplachne, ix., 135, 137; x., 8, 30; xiii., 118; xiv., 49.
Diplachus, xiii., 239; xiv., 101.
Diplocea, ix., 135.
Diplonels, xiv., 71.
Diplopappus, vii., 53; xi., 102, 103.
Diplophyllum, xvi., 79.
Diplotaxis, vii., 123.
Dipsacus, vii., 53, 124; xiii., 83; xiv., 186, 210, 219, 261; xv., 25.
Dirca, xi., 89; xiv., 186; xv., 328.
Discella, ix., 8.
Discoplea, xvi., 209.
Discopleura, vii., 87; ix., 24; xv., 57.
Disporum, xv., 187, 296.
Dissanthelium, ix., 135, 137.
Distichium, xvi., 107.
Distichlis, ix., 135, 137; x., 31, 65; xiv., 150.

Draba, xvi., 221, 242.
Doassania, xv., 145.
Docidium, viii., 4, 39; x., 16; xi., 14; xii., 2, 133; xiii., 59, 93; xv., 158; xvi., 185.
Dodecatheon, ix., 55, 91; xi., 31; xiii., 170, 223; xv., 240; xvi., 38.
Dodonæa, xvi., 191.
Dolichos, xi., 125; xiii., 138.
Dollocarpus, xvi., 14.
Donnellia, vii., 15.
Dorcadion, xvi., 331.
Dorstenia, xv., 172.
Dorychnium, vii., 124.
Dothidia, viii., 29, 74, 124.
Douglasia, xii., 26; xv., 201.
Dowingia, xiv., 16.
Draba, vii., 11, 21, 25; viii., 23, 71; ix., 124; x., 125; xi., 54; xii., 26; xiii., 66, 70; xv., 17, 175, 200, 210.
Dracæna, xv., 289.
Dracocephalum, xv., 58.
Draparnaldia, viii., 40; xv., 156.
Drimys, xiii., 203, 240.
Drosera, vii., 82; viii., 22, 120; x., 67, 106; xi., 81, 134; xii., 37, 103; xiii., 5, 83; xiv., 102, 233; xv., 133; xvi., 132, 287.
Druparia, xii., 37.
Dryas, xii., 26; xiii., 195.
Drymaria, xvi., 61.
Drymoglossum, viii., 89.
Duguetia, xvi., 14.
Duliehium, xiv., 135; xv., 100.
Dumontia, xvi., 2.
Durvillæa, xv., 19.
Duvana, xiv., 102; xvi., 46, 191.
Dysodia, xi., 129; xiii., 116.
Eacles, xiv., 60.
Eatonia, vii., 1, 12, 21; ix., 135; x., 30, 65; xiii., 84, 96; xvi., 36.
Echidiocarya, ix., 129; xii., 11; xiv., 100, 150.
Echinacea, xv., 128.
Echinocactus, x., 83, 84; xii., 61; xiii. 146; xiv., 159, 241; xv., 55, 128; xvi., 253.
Echinocystis, viii., 48; xiv., 60, 102, 155; xv., 22, 148, 302; xvi., 203.
Echinodorus, xvi., 70.
Echinopepon, xiv., 155.
Echinops, xiv., 210; xvi., 247.
Echinospermum, viii., 76; ix., 128, 150; xiv., 219; xvi., 38.
Echium, vii., 27, 53, 122; viii., 7; x., 120; xi., 9; xii., 39; xiii., 60, 84; xiv., 148, 245.
Eclipta, vii., 124; xi., 103; xii., 39; xvi., 24.
Ectocarpus, ix., 70; xi., 30; xii., 125; xiii., 108; xv., 311. xvi., 11, 27, 28, 113.
Edosmia, xvi., 176.
Eichornia, xvi., 228.
Elachistea, xiii., 108; xv., 312.
Elaphomyces, xvi., 297.
Elaterium, xiv., 155.
Elatine, vii., 113; xvi., 286, 287, 331.
Eleagnus, vii., 120.
Eleocharis, vii., 19, 82; viii., 28; ix., 56, 151; x., 46, 101; xi., 87, 91; xii., 40; xiv., 224; xv., 100, 297; xvi., 134, 247, 264.
Eleusine, vii., 125; ix., 135, 137; xv., 117.
Elephantopus, xiii., 70.
Ellonurus, ix., 135, 136; xiv., 99; xvi., 235.
Elisia, xv., 128.
Elodea, xiii., 98.
Elodes, x., 33; xii., 103; xiii., 98.
Elodium, vii., 16.
Elymus, vii., 28; ix., 135; x., 9, 32, 78, 121; xi., 126, 139; xiii., 119, 120, 179, 249; xiv., 151, 237; xv., 48, 297; xvi., 247, 290.
Embelia, xv., 138.
Embothrium, xv., 19, 107.
Empetrum, ix., 140; xi., 97, 98, 100, 120, 132; xii., 94, 103; xv., 18, 107.
Empusa, xv., 171.
Encalypta, xiv., 23; xvi., 94, 107.
Encelia, x., 41; xv., 242; xvi., 283.
Enchnosphæria, x., 127.
Encyonema, xv., 183.
Endocarpon, x., 23; xiv., 134, 248.
Endocarpiscum, xvi., 106.
Ensienia, xiii., 117.
Enteromorpha, xi., 131; xv., 19.
Entocladia, viii., 40.
Entomophthora, xiv., 60; xv., 171.
Entomosporium, xvi., 231.
Entophysalis, xv., 309.
Entyloma, xi., 42.
Ephedra, ix., 80; xii., 50; xiii., 188; xv., 138, 275, 324; xvi., 13.
Ephemerum, vii., 7; xv., 114.
Epicampes, ix., 135; x., 8; xiv., 99.
Epidendrum, ix., 115.
Epigæa, vii., 18; viii., 96; ix., 12, 92, 115; x., 67; xi., 105; xii., 17; xiii., 5, 60, 88; xiv., 188; xv., 201, 222, 245.
Epigeos, xv., 117.
Epilobium, vii., 28, 57, 60; viii., 125, 132; ix., 8, 23; x., 24, 33, 44; xi., 36; xii., 101, 103; xiii., 189; xiv., 231, 233; xv., 24, 135, 299; xvi., 151, 287.
Epimedium, xiii., 180.
Epipactis, vii., 97; ix., 127; x., 81; xiv., 151, 209.
Epipetrum, xvi., 170.
Epiphegus, vii., 62; xvi., 86.
Epithemia, xiv., 28, 30; xv., 129, 130, 183; xvi., 209.
Equisetum, vii., 22, 126; x., 46; xi., 7, 36, 90; xii., 8; xiii., 7, 94, 227; xiv., 52, 55, 78, 237; xv., 173, 240, 247; xvi., 290.
Eragrostis, vii., 1, 12; viii., 93, 120; ix., 135; x., 30; xii., 40; xiv., 244, 260; xvi., 70.
Eranthis., xv., 127.

Erechthites, x., 33, 44; xiv., 170; xvi., 288.
Eremocarpus, xvi., 230.
Eremocarya, xiv., 191.
Eremochloe, ix., 135; xv., 117; xvi., 234.
Eremosphæra, xv., 157.
Eremostachys, xiv., 23.
Eremurus, vii., 99.
Erianthus, viii., 120; ix., 135; xvi., 233.
Erica, xiii., 12., 203, 204, 227, 240, 246; xiv., 11; xv., 244, 245.
Erigenia, vii., 87; xiii., 114.
Erigeron, vii., 49, 68, 112; viii., 75, 91; ix., 20, 56, 141; xi., 104, 128, 129; xii., 25, 26; xiii., 30, 85; xiv., 68, 146, 164, 234; xv., 92, 214, 243, 299; xvi., 46, 86, 288.
Erineum, x., 75.
Eriocaulon, vii., 113; x., 106; xiv., 237; xvi., 286, 290, 292, 331.
Eriochloa, ix., 75, 134, 136; xiii., 25, 229.
Eriochrysis, xvi., 233.
Eriocoma, viii., 76; ix., 136; x., 63; xv., 49.
Erioderma, xiv., 222; xvi., 199.
Eriodictyon, xiii., 177.
Eriogonum, ix., 32; x., 96, 107; xi., 104; xiii., 42; xiv., 105, 127, 217, 260; xv., 200, 239; xvi., 86, 144, 152, 203, 307, 314.
Eriophorum, vii., 12; ix., 36, 72; x., 67; xi., 36; xiii., 189; xvi., 83, 124.
Eriophyllum, xiv., 150.
Eriosphæria, x., 127.
Erisyphe, xiv., 193; xv., 119, 201.
Eritrichium, viii., 76; ix., 156; xii, 11, 26; xiv., 100, 191.
Erodium, vii., 123; viii., 120; x., 75, 129; xiv., 151, 219, 267; xv., 136; xvi., 201.
Ervum, xiv., 86; xvi., 34.
Eryngium, vii., 87, 115; xi., 104; xiii., 88, 127; xiv., 51, 159; xv., 57, 222, 224, 236.
Erysimum, xiii., 83, 218.
Erythea, xi., 69.
Erythræa, viii., 59, 132; ix., 6; x., 121; xi., 67; xii., 48; xv., 255.
Erythrochiton, xvi., 160.
Erythronium, vii., 97; ix., 96; xii., 53; xiii., 115; xiv., 19, 126, 169; xv., 111., 120, 133, 201, 222, 275; xvi., 131, 146.
Erythroxylon, xiii., 8; xiv., 125, 128; xvi., 157, 335.
Eschscholtzia, vii., 123; xiii., 217; xiv., 86, 101, 102, 196, 219; xv., 243; xvi., 15, 56, 228, 243.
Esenbeckia, xvi., 160.
Ethmodiscus, xiv., 175; xvi., 74.
Euastrum, vii., 45, 91; viii., 3, 39; ix., 27; x., 18; xi., 13, 15, 16; xii., 3, 4, 133; xiii., 58, 59, 93; xv., 159; xvi., 187.
Eucalyptus, vii., 37, 71; xii., 65; xiii., 36, 241; xvi., 47.
Eucampia, xvi., 75.
Eucharidium, xv., 25.
Euchlæna, xv., 241.
Eudorina, vii., 44.
Eugenia, xiii., 241; xvi., 32, 57.
Euklastaxon, xvi., 239.
Eulobus, xvi., 205.
Eulophus, vii., 87.
Eulophia, xvi., 228.
Eumenes, viii., 135.
Eunanus, xiv., 104.
Eunotia, xvi., 75, 209.
Euodia, xvi., 76.
Euonymus,, vii., 52, 113; xi., 36; xiii., 94; xiv., 13; xvi., 60, 172, 202.
Eupatorium, vii., 82, 98, 112, 114, 115; viii., 130, 132; ix., 73, 150; x., 120; xi., 104; xiii., 5, 60, 70, 72, 115, 116; xiv., 60, 230, 234; xvi., 288.
Euphorbia, vii., 19, 34, 82, 115; viii., 7, 106, 120, 138, 142; ix., 23, 101, 156; x., 33, 35, 43, 46, 96; xi., 88; xii., 48, 53. 101; xiii., 5, 66, 69, 177, 189; xiv., 24; 67, 164, 184. 236, 241; xv., 133, 201, 221; xvi., 65, 144, 152, 289.
Euphrasia, ix., 140; xii., 103; xiii., 127, 232; xiv., 10, 12, 58, 235.
Eupodiscus, xiv., 141, 142; xvi., 75, 209.
Eurale, xvi., 338.
Eurotiopsis, xvi., 308.
Eurotia, xv., 241.
Eurotium, xiii., 126.
Eustachys, ix., 136.
Eustegia, ix., 8.
Eustichia, x., 99; xi., 72.
Eustichium, x., 99, 136.
Eustoma, xiv., 223.
Euthora, xi., 30; xiii., 112.
Eutriana, ix., 135; xi., 133.
Evallaria, xv., 286.
Evernia, ix., 152; xiv., 241; xv., 184.
Evolvulus, viii., 120.
Exidia, xv., 184.
Excipula, xi., 73.
Exoascus, xiii., 223; xiv., 240.
Exobasidium, xii., 68.
Faba, xvi., 242, 262.
Fabiana, xvi., 228.
Fabronia, vii., 15.
Fagus, ix., 91; x., 118; xi., 27; xii., 82; xiii., 202; xv., 106; xvi., 254, 289.
Farsetia, xii., 60, 80.
Fatsia, xi., 36.
Favolus, xvi., 202.
Fedia, vii., 124, ix., 150; xi., 102, 104.
Fegatella, xv., 320.
Fendlera, viii., 25; xvi., 118.
Fendlerla, ix., 136.
Fenestella, xvi., 257, 339.
Feijoa, xiii., 103.
Festuca, vii., 57, 61, 126; viii., 76, 129; ix., 120, 135, 151; x., 31, 78; xi., 126; xii., 25; xiii., 119, 187.
Ficus, x., 10; xii., 90; xiii., 36; xv., 201; xvi., 86, 87, 257, 311.

Filago, xiii., 70.
Fimbriaria, xiii., 224.
Fimbristylis, viii., 120; xi., 87; xii., 69; xv., 102; xvi., 83.
Fissidens, vii., 5, 6; xiii., 11, 173; xiv., 79, 88; xv., 186; xvi., 107, 307.
Fistulina, xiii., 175.
Flaveria, viii., 120; xiv., 44.
Flœrkea, vii., 52.
Fœniculum, xv., 223.
Fœtidaria, viii., 95.
Fontinalis, xv., 201, 243; xvi., 110.
Formica, viii., 69.
Forsythia, vii., 25; xiii., 237; xvi., 136.
Fothergilla, xv., 219.
Fouquiera, ix., 53; x., 123; xiii., 147.
Fragaria, vii., 11; ix., 93; xi., 74; xiv., 232.
Frankia, xiv., 199.
Francisea, xiii., 238.
Franceria, x., 42; xvi., 202.
Frasera, xiv., 102.
Fraxinus, vii., 83, 113; ix., 11, 54; x., 9, 98; xi., 23, 28, 107; xii., 82; xiii., 46, 176, 200, 233, 237, 244; xiv., 186, 235; xv., 212; xvi., 281, 310.
Frelichia, xi., 104.
Frenelopsis, xiii., 36.
Fremontia, xiii., 44; xiv., 102; xv., 223.
Freylinia, xiii., 238, 239.
Freziera, xvi., 63.
Fritillaria, viii., 81; xvi., 119.
Frullania, xv., 202.
Frullaria, x., 132.
Fuchsia, vii., 84, 98; viii., 60; ix., 102; xi., 9; xiii., 9; xiv., 88.
Fucus, xi., 36; xiii., 106, 109; xv., 171, 312; xvi., 6.
Fuirena, viii., 120; xi., 87; xvi., 83, 247.
Fumaria, vii., 51; xii., 48, 60; xv., 127, xvi., 15, 44.
Funaria, xiii., 73, 98; xiv., 88, 147; xv., 176; xvi., 30, 109, 249.
Furcellaria, xi., 36.
Fusarium, viii., 27, 52; xiii., 182; xvi., 231.
Fusisporium, xiii., 189.
Galactia, viii., 120; x., 35; xvi., 262, 324.
Galanthus, xiii., 48.
Galax, xiii., 74.
Galeopsis, vii., 93, 125; viii., 48; ix., 150; xii., 101; xiii., 189; xiv., 235; xv., 132.
Galinsoga, ix., 23; xiii., 188; xiv., 164.
Galipea, xvi., 160.
Galium, vii., 71, 74 124; viii., 8, 70; ix., 74, 150; x., 107, 120; xi., 128, 130; xii., 39, 62, 73; xiii., 74; xiv., 14, 16, 34, 104. 132, 147, 234; xv., 17; xvi., 52, 206, 288.
Galvesia, xiv., 102; xvi., 255.
Garberia, viii., 119.
Garrya, x., 106; xv., 219.
Gastridium, ix., 34, 105, 135; x., 8.
Gaultheria, ix., 6; xi., 101, 132; xii., 17, 19, 39; xiii., 189; xiv., 188; xvi., 53, 133, 150, 263.
Gaura, xv., 132, 214.
Gaylussacia, vii., 12, 53, 82, 98; x., 105; xi., 99, 101; xii., 68, 94; xiv., 188; xv., 128; xvi., 21, 59, 168, 278.
Gayophytum, x., 96.
Geanthus, xvi., 170.
Geaster, viii., 34, 108; xv., 22; xvi., 202, 254.
Gelasine, xiv., 68.
Gelatosporium, x., 117.
Gelidium, xiii., 119; xv., 313.
Gelsemium, xii., 12.
Genicularia, xii., 133; xiii., 59.
Genista, vii., 120; ix., 23; xii., 40.
Gentiana, vii., 27, 114; viii., 75; x., 69, 105; xi., 36, 108; xii., 24, 40; xiii., 47, 72, 125; xiv., 102, 186; xv., 94; xvi., 53, 129.
Geomalcus, xiv., 86.
Geranium, vii., 49, 123; viii., 8; ix., 36; x., 67, 107; xii., 12, 25, 48, 136; xiii., 246; xv., 113, 133; xvi., 45, 52, 135, 158, 268, 287.
Gerardia, vii., 19, 29, 113; viii., 28; x., 132, 136; xi., 66, 109, 111, 112, 118; xii., 37; xiii., 5, 31, 47, 75, xiv., 187; xv., 132; xvi., 53.
Gesnera, xv., 202.
Geum, vii., 52; ix., 114; xi., 36, 84; xii., 100; xiii., 73; xiv., 13, 232; xv., 17, 204; xvi., 21, 204, 287, 329.
Gigartina, xiii., 112.
Gilia, viii., 70, 142; xi., 12, 67; xiii., 126; xiv., 164, 196; xv., 25, 128; xvi., 283.
Gillenia, xii., 101; xiii., 177; xiv., 186.
Ginkgo, see Salisburia, xiv., 20.
Glœosporium, xv., 119; xvi., 196, 231, 255, 257.
Glaucium, vii., 18; viii., 114.
Glaziophyton, xvi., 336.
Gleditschia, x., 49, 50; xiii., 31, 117; xiv., 225, 242; xv., 100.
Gleichenia, xiii., 35; xiv., 37; xv., 248.
Glœocapsa, ix., 67, 68; xi., 131; xv., 309.
Glœococcus, vii., 44; xiii., 93.
Glœocystis, viii., 37; xv., 157.
Glœosiphonia, xvi., 3.
Globularia, xiii., 236.
Gloiotrichia, vii., 44.
Glonium, x., 76.
Glyceria, vii., 12, 27, 28, 61, 82, 98, 113, 114, 126; ix., 23, 135, 137; x., 77, 78; xii., 25; xiii., 119; xiv., 153, 237; xv., 48, 117.
Glycyrrhiza, ix., 156; x., 102.
Glyptostrobus, vii., 79.
Gnaphalium, vii., 27, 82; viii., 120; x., 33; xii., 103; xiii., 69, 73; xiv., 146, 159, 164; xv., 17, 128, 136; xvi., 46.
Gnomonia, x., 98; xvi., 26.
Godetia, xiv., 104.
Godronia, xiv., 244.
Gomphosphæria, ix., 25.
Gonatobotrys, x., 7.

Gonatonema, x., 15.
Gonatozygon, ix., 27; x., 14; xii., 133; xiii., 59.
Goniostomum, vii., 112.
Goniothecium, xvi., 75.
Gonium, ix., 26.
Gonolobus, xv., 242.
Gonphonema, xv., 183.
Gonzalea, xv., 242.
Goodyera, x., 34; xii., 101; xiv., 153; xv., 296; xvi., 265.
Gordonia, viii., 113, 117; xv., 219.
Gossypium, xii., 41; xvi., 154.
Gouania, xvi., 189.
Gracilaria, ix., 71; xi., 29, 30; xiii., 113; xv., 313.
Grammatophora, xiv., 28, 29, 30; xv., 131; xvi., 75, 209.
Graphephorum, ix., 135; xiv., 132; xv., 295.
Graphis, xiv., 248; xvi., 29, 105, 330.
Graphium, viii., 65; xiv., 209.
Gratiola, vii., 28, 98, 115; ix., 139.
Grayia, xii., 116; xv., 68.
Greenella, vii., 112; xvi., 205.
Greenia, ix., 134, 136; x., 35.
Greeneria, xiv., 260; xvi., 248.
Greggia, x., 96.
Grewiopsis, xiv., 172.
Griffinias, xvi., 336.
Griffithsia, xi., 29, 30; xiii., 111; xv., 313.
Grimaldia, xv., 202,
Grimmia, xiv., 23, 148; xv., 185; xvi., 93, 107, 124, 225, 340.
Grindelia, ix., 31; xi., 104, 122; xiii., 177; xiv., 242; xvi., 119.
Grinnellia, viii., 107; ix., 96; xi., 29, 30; xiii., 112; xv., 313.
Guarea, xvi., 189.
Guatteria, xvi., 14, 15: 120.
Guazuma, xvi., 155.
Gualacum, x., 129; xiii., 238; xvi., 56.
Guzmania, xvi., 168.
Gyalecta, xii., 61.
Gymnanthes, xvi., 311.
Gymnocladus, ix., 36, 130; xi., 121; xii., 100; xiii., 19, 22, 23, 24, 117; xvi., 85.
Gymnoderma, xiv., 222.
Gymnogongrus, xiii., 111; xv., 184.
Gymnogonum, x., 23; xv., 228.
Gymnogramme, vii., 50, 63, 85; viii., 36, 79; ix., 22; 62, 92; xi., 48; xiii., 131; xiv., 148, 194; xv., 252; xvi., 336.
Gymnopogon, ix., 135.
Gymnosporangium, viii., 71, 72, 85; xii., 12; xiii., 176, 179, 224; xiv., 60, 132; xvi., 231, 308.
Gymnostichum, ix., 135, 137, 153.
Gymnostomum, vii., 5; xvi., 94, 106.
Gymnothrix, ix., 134.
Gynozyga, xvi., 333.
Gypsophila, ix., 149; xi., 95.
Gytonanthus, xiii., 196.
Habenaria, vii., 12, 17, 19, 28, 93, 113, 114; viii., 7, 12; ix., 23, 36, 114; x., 34, 36; xi., 36, 128, 134; xii., 25, 40, 53, 101; xiii., 5, 227; xiv., 153, 236; xv., 55, 136, 243, 320; xvi., 124, 265, 290.
Habrothamnus, xv., 242.
Halenia, viii., 46; xiii., 8; xiv., 200, 235.
Halesia, xi., 61; xiii., 74, 79; xiv., 194; xv., 223.
Halictus, viii., 135.
Halleria, xiii., 239.
Halodule, xiii., 162.
Halurus, xiii., 111.
Hamamelis, x., 7; xi., 125; xii., 82, 114; xiii., 177; xv., 223; xvi., 314.
Hamelia, xiv., 170.
Hanburia, xvi., 33.
Haplaria, x., 97.
Haplosiphon, viii., 39; xv., 161.
Haplospora, xvi., 113.
Harbouria, xvi., 122.
Harfordia, xiii., 147, 174; xvi., 277.
Harknessia, ix., 99.
Harpelyce, xv., 115.
Harpidium, xvi., 97.
Harpagonella, ix., 129.
Harpalium, xv., 275.
Hartwrightia, xv., 200.
Hasseltia, xvi., 157.
Hazardia, xiv., 104.
Havetia, xvi., 62.
Hedeoma, x., 33; xv., 94.
Hedera, xiii., 36; xvi., 251.
Hedwigia, xvi., 109.
Helenium, ix., 113; xi., 103, 130; xiii., 47, 74; xiv., 219.
Heleochloa, ix., 135, 136.
Helicoma, ix., 124.
Helicosporium, viii., 97; ix., 98.
Helianthella, xii., 25.
Helianthenum, viii., 75; ix., 113; xiv., 15.
Helianthus, vii., 53, 82, 114; ix., 150; x., 54, 81, 121; xi., 103, 104, 128, 129; xiii., 75, 116; xiv., 13, 66, 219, 241; xv., 325; xvi., 59, 69, 120, 133, 140, 169, 176, 288.
Helichrysum, xi., 94, 95; xiii., 37, 195.
Heliconia, xiv., 87; xv., 202.
Helicteres, xvi., 154.
Helielta, xvi., 309.
Heliocarpus, xvi., 156.
Heliocharis, xiii., 94; xv., 100, 146; xvi., 83.
Heliopelta, xvi., 72.
Heliopsis, vii., 113; xiii., 83; xv., 267; xvi., 68, 133.
Heliosciadium, xvi., 46.
Heliotropium, vii., 125; viii., 120; xiv., 41.
Helleborus, xiv., 178; xv., 127.
Helminthosporium, x., 50.
Helonias, viii., 91; ix., 101, 119, 150; xi., 9; xv., 175.

Helopus, ix., 75, 136.
Heloscladium, vii., 124.
Helotium, x., 62, 98.
Hemarthria, xi., 139; xv., 117.
Hemicarpha, xi., 87; xv., 104.
Hemiaulus, xvi., 209.
Hemizonia, viii., 142; ix., 15, 16, 63, 109, 110, 122, 145; x., 41; xiii., 43; xvi., 151.
Hemitelia, viii., 226; xv., 248.
Hendecandra, xvi., 230.
Hendersonia, ix., 74, 133; xi., 73.
Hepatica, (Fegatella) xv., 320.
Hepatica, (Anemone) vii., 1, 97; viii., 36; ix., 10, 144; xi., 55; xiii, 114; xiv., 121; xvi., 173.
Heppia, xiv., 222; xvi., 106.
Heracleum, vii., 87, 124; xi., 139.
Hesperis, vii., 51; xiii., 83, 143, 144.
Hesperochiron, xv., 110; xvi., 176.
Heteranthera, vii., 97; xv., 300; xvi., 70.
Heterocentron, ix., 11.
Heterociadium, xv., 186; xvi., 97.
Heteromita, xiii., 102.
Heteropteris, xvi., 158.
Heteropogon, ix., 87, 135, 136; xv., 117; xvi., 241.
Heterosporum,, xv., 202; xvi., 173.
Heterotrichium, xvi., 168.
Heuchera, xiii., 70, 72; xiv., 16, 79, 104; xv., 58, 172, 202, 242.
Hevia, xiv., 250.
Hexagona, x., 73.
Hexameria, xiv., 155.
Hibiscus, vii., 19; viii., 120; ix., 117; x., 9; xiii., 60, 94; xiv., 102; xv., 148, 325.
Hicoria, xv., 277, 301; xvi., 183, 169, 311.
Hieracium, vii., 115, 125; viii., 112; ix., 12, 17, 36, 64; xi., 104; xiii., 83; xiv., 234; xv., 91, 148; xvi., 87, 123, 136, 288.
Hierochloa, viii., 39; ix., 135; x., 8, 63; xii., 103; xiv., 30.
Hilaria, ix., 32, 77, 86, 135, 136; xi., 38; xiii., 249; xiv., 100; xvi., 202.
Hildenbrandtia, viii., 37; xiii., 110; xv., 112; xvi., 6.
Himantostemma, xii., 11.
Hippocrepis, viii., 142.
Hippuris, xii., 103; xiv., 233; xv., 19.
Hiræa, xvi., 158.
Holcus, ix., 135; xiv., 151.
Holacantha, x., 123; xii., 50; xiii., 181.
Holozonia, ix., 122, 145.
Homæocladia, xiv., 30.
Homalothecium, xv., 186, 201.
Homolanthus, xv., 17.
Hookera, xiii., 44; xiv., 15, 196.
Hookeria, xiii., 44.
Hordeum, vii., 126; ix., 135, 137; x., 8, 32, 78, xii., 103, 110; xiii., 119; xvi., 59, 206.
Horkelia, x., 107; xiv., 150, 263; xv., 24; xvi., 221.
Hormactis, xiii., 106.
Hormidium, viii., 40.
Hormiscia, vii., 48.
Hormotrichum, viii., 40.
Horsfordia, xiv., 101; xvi., 86.
Hosackia, xi., 104; xiv., 16, 150; xvi., 149, 151, 202, 203, 253, 283.
Houstonia, vii., 49; ix., 10; xi., 9; xiii., 72, 224; xiv., 20, 154; xv., 147; xvi., 136, 163.
Hoya, xiv., 68.
Hudsonia, vii., 82, 98; ix., 119; xi., 100; xii., 93, 94; xiii., 19, 220.
Humulus, xi., 108; xii., 29, 30, 53, 101; xv., 118, 223; xvi., 136.
Hunnemannia, xiv., 195, 196.
Hyacinthus, xiii., 137.
Hyalotheca, xi., 15; xii., 1; xv., 158.
Hyalodiscus, xvi., 75, 209.
Hydnum, viii., 34, 57; xii., 37; xiii., 175.
Hydrangea, vii., 25; viii., 12; ix., 72; xiii., 70, 71, 116, 238; xiv., 185; xv., 132, 258; xvi., 139.
Hydrastis, xii., 100; xiii., 115.
Hydrochloa, ix., 134.
Hydrocotyle, vii., 87; ix., 23; x., 46, 120; xiii., 28; xiv., 159; xv., 56; xvi., 281.
Hydrodictyon, xiv., 132.
Hydrophyllum, vii., 49; xiii., 70, 115; xv., 146; xvi., 38.
Hydropyrum, ix., 134.
Hydrosera, xvi., 72, 75.
Hydrothrix, xv., 300.
Hydrurus, x., 14.
Hygrophorus, viii., 57.
Hylocomnium, vii., 7.
Hymenœa, xiii., 36, 37.
Hymenatherum, xi., 129.
Hymenocallis, xv., 172, 273.
Hymenochæte, vii., 84.
Hymenoconidium, xvi., 80.
Hymenopappus, ix., 63; xi., 128, 130.
Hymenophallus, viii., 96.
Hymenophyllum, xii., 117; xiii., 45; xiv., 86; xv., 107, 248.
Hymenothecum, ix., 135.
Hymeranthus, xvi., 45.
Hyoscyamus, vii., 125; xvi., 70, 180.
Hyparrhuna, xvi., 241.
Hypericum, vii., 17, 52, 93; ix., 74; x., 33; xii., 53, 92, 101, 103; xiii., 70, 76, 98, 172, 224; xiv., 67, 83, 186, 232; xv., 94, 132, 204, 234, 246; xvi., 62, 140, 242, 255, 282.
Hyphæothrix, x., 21; xvi., 308.
Hypnea, xi., 30; xiii., 112.
Hypnum, vii., 6, 7, 8, 16; ix., 62; xiv., 25, 104; xv., 186, 220; xvi., 30, 97, 111, 194, 249, 306.
Hypochœris, xv., 180.
Hypocrea, xv., 54.
Hypolepis, xv., 249.
Hypolytrum, xvi., 83.

Hypomyces, xi., 28.
Hypopitys, xvi., 297.
Hypoxis, viii., 46; xvi., 120.
Hypoxylon, xiii., 176; xv., 202, 223, 242; xvi., 174.
Hypseocharis, xvi., 159.
Hyssopus, xv., 223.
Hysterium, x., 84.
Hystrix, ix., 135.
Icteres, ix., 56.
Ilex, vii., 19, 101; viii., 6, 65, 112, 128, 132; ix., 36, 99, 152; x., 67; xi., 136; xii., 63, 114; xiii., 36, 72, 79, 177; xiv., 161, 162; xv., 58, 245; xvi., 58, 87, 202, 229, 289, 309.
Illicium, xii., 63; xiii., 240; xvi., 282.
Ilysanthes, ix., 141.
Impatiens, vii., 20; x., 119, 136; xi., 35; xii., 68, 101; xiii., 116, 128; xiv., 86, 232; xv., 301; xvi., 51, 209, 329.
Imperata, ix., 86, 135; xiii., 26; xvi., 233.
Indigofera, viii., 120; xiii., 230; xvi., 259.
Inocybe, xvi., 173.
Inula, xiii., 195; xiv., 144.
Ionidium, vii., 123; xvi., 18.
Ipomœa, vii., 53, 82, 125; viii., 120; x., 92, 122; xii., 39, 48, 95; xiii., 71, 75, 176; xv., 128; xvi., 70, 88, 120, 200.
Iris, vii., 13, 73; ix., 23, 83, 96, 128; x., 69; xi., 93; xii., 103; xiii., 94, 101, 176, 188, 246; xiv., 60, 67, 151, 185, 236; xv., 93, 113, 146, 170.
Iritis, xiv., 171.
Isacne, ix., 134, 135; x., 8.
Isactis, viii., 38; xiii., 106; xv., 310.
Isanthus, xi., 116.
Isaria, xi., 115.
Isariopsis, ix., 98.
Ischæmum, ix., 135; xvi., 234.
Isoetes, vii., 57, 74, 113; ix., 34, 108; x., 106; xi., 8, 40; xii., 40; xiii., 81; xv., 146; xvi., 286, 290.
Isolepis, xv., 102; xvi., 83.
Isomeris, x., 75; xv., 239.
Isopyrum, ix., 96; xiii., 114; xv., 126.
Isotria, xii., 37.
Iva, viii., 75.
Ivesia, x., 107; xii., 25; xiv., 263; xv., 93, 200.
Jamesia, vii., 120; xv., 54, 223.
Jamesonia, xv., 252.
Janipha, xvi., 274.
Jatropha, xvi., 274.
Jeffersonia, x., 9; xi., 69; xiii., 70, 115, 177; xv., 257.
Juglans, vii., 107, 120; viii., 22; ix., 54; x., 123; xi., 70; xii., 89; xiii., 36, 117, 228; xiv., 186, 190; xv., 206, 277; xvi., 59, 113, 133.
Juncus, vii., 18, 19, 22, 36, 82; viii., 6, 29, 46, 47, 71, 90, 124; x., 9, 67, 81; xi., 20, 40, 127, 128; xii., 40, 69, 70, 103; xiii., 5, 6, 73, 84, 85; xiv., 169, 187, 237; xv., 98, 200, 204; xvi., 134, 204, 264, 290, 329.
Jungermannia, xi., 137; xv., 202; xvi., 250.
Juniperus, viii., 46, 72, 76, 85, 92; ix., 65, 79, 156; x., 48; xi., 23, 40; xii., 24, 47; xiii., 36; xiv., 61, 210, 223, 239; xvi., 311.
Jussiæa, xiv., 8, 24; xvi., 320, 332.
Justicia, viii., 120.
Kalchbrennera, viii., 95.
Kallymenia, xi., 132.
Kalmia, vii., 29, 82, 98; ix., 36; x., 67; xi., 11, 90, 101; xii., 53, 54, 72, 82, 87, 94; xiii., 5, 189; xiv., 230, 235; xv., 165, 223; xvi., 24, 263.
Kellermannia, xiii., 224.
Kobresia, xvi., 83.
Kœberlinia, xvi., 309.
Kœleria, ix., 135; x., 65, 70; xiii., 249.
Kosteletzka, x., 135.
Krigia, xi., 104.
Krynitzkia, xii., 11; xiv., 100, 191; xv., 20; xvi., 283.
Kuhnia, xi., 128, 129.
Kumlienia, xiii., 45.
Kyllingia, xvi., 83.
Kymapleura, x., 88.
Lachnanthes, vii., 98; x., 121.
Lachnocladium, xvi., 118.
Lachnostoma, xii., 11.
Lactarius, viii., 58; xii., 124; xiii., 175; xiv., 130.
Lactuca, xi., 102, 104, 123, 129; xiii., 83, 188; xiv., 234; xvi., 24, 34, 123, 133, 229.
Lælia, vii., 84; xvi., 141.
Læstadia, xiv., 244; xvi., 31.
Lagenaria, xv., 223.
Lagophylla, ix., 122, 145; x., 86.
Lallemantia, xv., 188.
Lamarkia, ix., 135; x., 8.
Lamium, xii., 51, 68.
Laminaria, vii., 117; viii., 67, 68; xiii., 109, 222; xiv., 220; xv., 19, 312; xvi., 9.
Lamprothamnus, xv., 91.
Lampsana, xiv., 18.
Lamsana, vii., 53.
Langloisula, xvi., 254.
Lantana, ix., 117; x., 83; xii., 48.
Laplacea, xvi., 64.
Lappa, ix., 114; x., 121; xi., 104; xiv., 245; xvi., 288.
Lappago, ix., 135, 136.
Larix, viii., 92; x., 47; xi., 22, 84; xiii., 148, 203; xiv., 247; xv., 128, 136; xvi., 290, 311.
Larrea, x., 123; xii., 119.
Lasella, xiv., 105.
Lasiosphæria, x., 127.
Lasthenia, xv., 299.
Laternea, vii., 11, 30; viii., 96; xii., 37, 38.
Lathyrus, vii., 19; ix., 24; x., 46, 81; xiii., 83, 246; xiv., 68, 160, 186, 231, 232; xv., 17, 135, 200; xvi., 132, 262.
Laurencia, xvi., 2.
Laurus, xiii., 36; xv., 150; xvi., 232, 282, 310.
Lavendula, xvi., 34.

Layia, x., 36; xiii., 12.
Leathesia, xiii., 108; xv., 312.
Leavenworthia, vii., 60; xiv., 82.
Lecanidion, ix., 7.
Lecanora, x., 21: xi., 25, 26; xiv., 222, 248; xvi., 29, 87.
Lechea, vii., 113; viii., 28, 115, 116; xii., 62; xiv., 36, 187, 268; xvi., 132.
Lecidia, ix., 7; x., 21, 22; xi., 25; xiv., 248; xvi., 29, 87, 104, 250, 330.
Lecythis, xiv., 268; xvi., 180.
Ledum, xi., 11, 65; xii., 17; xiii., 189, 195, 204; xiv., 220, 235; xv., 242.
Leersia (Encalypta), xvi., 225.
Leersia, (Homalocenchrus) ix., 77, 134; xiv., 202, 262; xv., 25, 202; xvi., 107, 231.
Leguminosites, xiv., 4.
Leiophyllum, xi., 100; xiii., 72.
Lejeunia, xiv., 85; xv., 202.
Lemna, vii., 27, 64; x., 67; xiii., 94; xiv., 162.
Lentinus, vii., 58; xiii., 63; xv., 146, 184.
Lenzia, xvi., 170.
Leonia, xvi., 19.
Leontodon, vii., 114; viii., 128; ix., 23; x., 36; xii., 59; xiii., 14; xiv., 14; xvi., 94.
Leotia, ix., 1.
Leonurus, xiii., 189.
Leontopodium, xv., 128.
Lepicystis, xvi., 58.
Lepidium, vii., 34, 123; viii., 70, 114, 120, 141, 142; xii., 59; xiii., 180; xv., 24; xvi., 16, 44, 255, 337.
Lepidodendron, vii., 75; viii., 62; xii., 68; xiii., 68; xvi., 336.
Lepigonum, xiv., 147, 196, 261; xvi., 196.
Lepraria, xii., 131.
Leptobryum, xvi., 110.
Leptocaulis, xv., 57.
Leptochloa, ix., 135, 137, 147; x., 30, 129; xii., 7.
Leptochloris, x., 8.
Leptogium, xv., 184; xvi., 283.
Leptolepsis, xvi., 83.
Leptopoda, xi., 103.
Leptospermum, xiii., 241.
Leptosphæria, viii., 124; x., 53; xi., 42; xiv., 244; xvi., 226.
Leptothrix, xi., 102; xvi., 88.
Leptotrema, xvi., 87.
Leptozosma, xii., 133; xiii., 58.
Lepturus, ix., 136, 153; x., 8; xiii., 100.
Leskea, xv., 186, 201; xvi., 97, 250.
Lespedeza, ix., 72, 113; x., 9; xi., 54, 127; xiii., 75, 83; xiv., 151, 187, 188.
Lesquerella, xv., 200.
Lessonia, viii., 68.
Leucæna, xvi., 282.
Leucanthemum, vii., 17; viii., 93, 129; xi., 54, 103.
Leucolepis, xvi., 110.
Leuconymphæa, xiv., 179.
Leucophyllum, xiii., 192.
Leucothoe, xii, 17; xiii., 5, 74; xvi., 168.
Lewisia, xiv., 79; xvi., 282.
Liatris, vii., 112; ix., 156; xi., 103, 104; xiii., 5; xvi., 293.
Libocedrus, xiii., 36; xv., 108.
Libonia, xiii., 225.
Licania, xvi., 201.
Lichenopsis, xvi., 203.
Liemophora, xiv., 29, 31; xv., 131.
Ligea, xvi., 312.
Ligusticum, vii., 87; xi., 73; xiii., 246.
Ligustrum, xiii., 233, 237.
Lilæa, xvi., 44.
Lilium, vii., 17, 60, 83, 97, 120; viii., 115; ix., 144, 153; x., 67; xi., 21; xii., 87, 116; xiii., 31, 46, 76, 98, 125, 149, 177, 250; xiv., 221; xv., 58, 68, 114, 276, 302; xvi., 148, 169.
Limnanthemum, x., 34, 60; xi., 139; xii., 13, 14, 15, 32; xiii., 252; xiv., 87, 176; xv., 29; xvi., 123, 286, 289, 331.
Limnanthes, xv., 113.
Limnæa, xiv., 86.
Limnas, ix., 136.
Limnetis, ix., 134.
Limnobium, xiii., 227.
Limnocharis, xiv., 87.
Limosella, vii., 18; xiii., 5; xv., 19.
Linaria, ix., 141; xi., 66, 67; xiii., 116; xiv., 24, 164, 235; xvi., 289.
Lindera, ix., 20; xii,, 82; xiii., 116; xiv., 171.
Lindsaya, xv., 248.
Lingua, viii., 88.
Linnæa, viii., 47; ix., 12, 114; xii., 53; xiv., 136, 138, 234; xv., 132; xvi., 263, 288.
Linum, vii., 11, 52; viii., 28; ix., 121; x., 96; xi., 8, 35; xiii., 70, 189; xiv., 86, 186, 195; xv., 182, 214; xvi., 70.
Liparis, vii., 19, 54; viii., 114, 115; x., 121.
Lippia, xii., 48; xiii., 117; xiv., 159.
Liquidambar, xi., 87; xiii., 177; xiv., 95, 108, 197, 201, 223; xvi., 60, 174.
Liphocarpha, xvi., 83.
Liradiscus, xvi., 209.
Liriodendron, vii., 102, 108; x., 33, 74; xi., 84; xii., 12, 82; xiii., 36, 117, 150, 193, 240; xiv., 1, 221, 242; xv., 120, 242; xvi., 59.
Listera, viii., 47; xii., 53; xvi., 265.
Lithospermum, vii., 19; ix., 156; x., 108; xii., 111; xv., 28, 94; xvi., 38, 256.
Lithothamnion, x., 56.
Littorella, vii., 1, 22; xiv., 19, 246, 262.
Lobelia, vii., 19; viii., 28, 46, 120; x., 34. 45, 106; xi., 50, 51, 92; xii., 96; xiii., 30, 47, 60, 73, 74, 149; xiv., 39, 80, 81, 172, 185, 230, 234; xv., 132, 203; xvi., 200, 286, 289, 292, 331.
Lolium, ix., 135; xiii., 61.
Lomaria, xi., 36; xv., 249.
Lomentaria, xi., 29; xiii., 112; xv., 313; xvi., 2.

Lonchocarpus, xvi., 325.
Lonicera, vii., 11, 27, 52, 53; ix., 36, 150; x., 33, 67, 94, 136; xi., 76, 82, 102, 128, 129, 139; xii., 39; xiii., 5, 83; xv., 128, 135, 224; xvi., 58, 132, 139, 206.
Loperia, xvi., 228.
Lophanthus, vii., 12, 53; viii., 115; xvi., 133.
Lophiostoma, viii., 90, 125; ix., 19; x., 52, 89.
Lophium, x., 84.
Lophochlæna, ix., 135, 137; x., 65.
Lophogyne, xvi., 312.
Loranthus, viii., 116.
Lorentziella, xv., 114.
Lotus, xiii., 188.
Louteridium, xv., 200; xvi., 120.
Lucuma, xiv., 162.
Ludwigia, x., 33, 102; xii., 37; xiv., 8, 61.
Luhea, xvi., 156.
Lupinus, vii., 19, 36; viii., 81, 130; ix., 156; x., 81; xi., 84, 127; xiii., 22, xiv., 168, 187, 196, 199; xv., 243, 299; xvi., 150, 204, 242, 259.
Luziola, ix., 134.
Luzula, xi., 32; xv., 296; xvi., 264.
Lychnis, vii., 52, 123; viii., 32; ix., 56; xii., 87, 100; xiii., 83; xiv., 245, 261; xvi., 61.
Lychnothamnus, xv., 91.
Lycium, x., 58; xii., 34; xiv., 102; xv., 276; xvi., 144.
Lycoperdon, vii., 31, 58; ix., 2, 126; x., 67; xiii., 175; xv., 298, 326. xvi., 120, 284.
Lycopersicum, xiv., 172.
Lycopodium, vii., 14, 82, 98; xi., 8, 36; xii., 43, 55, 56; xiii., 5, 73, 81, 84; xiv., 167, 188, 238; xv., 247, 301, 317; xvi., 21, 264.
Lycopsis, xiii., 84.
Lycopus, xii., 103; xiii., 84; xv., 136.
Lycurus, ix., 135.
Lygodesmia, viii., 75; xi., 129; xvi., 231.
Lygodium, vii, 94; viii., 7, 23; ix., 60, 100, 115; x., 70; xi., 48; xiii., 224; xv., 145, 253.
Lyngbya, viii., 38; xi., 130; xiii., 105; xv., 310.
Lyngbyapapyrina, xii., 129.
Lynosyris, ix., 156.
Lyonothamnus, xii., 11; xiii., 96; xiv., 16.
Lysimachia, vii., 19; viii., 60; ix., 120, 150; x., 67; xi., 84; xiii., 101; xiv., 138, 153, 186; xvi., 70, 289.
Lysurus, vii., 30; viii., 96.
Lythrum, vii., 52; viii., 139; x., 46; xi., 8; xii., 60; xvi., 337.
Machærium, xvi., 324.
Macleania, xvi., 174.
Maclura, xi., 81.
Macounia, xv., 186.
Macrocystis, ix., 96; xv., 15, 19.
Macrorhynchus, x., 88.
Macrosporium, xvi., 203, 231.
Macrozamia, viii., 120.
Madia, ix., 63; xiii., 176.
Magnolia, vii., 28, 82, 101; viii., 23, 74; ix., 36, 73, 74, 111, 134; x., 76, 77, 95, 97; xi., 18, 42, 84; xii., 87; xiii., 5, 36, 38, 72, 80, 193, 240; xiv., 1, 20, 39, 43, 221; xv., 55, 106; xvi., 90, 283, 309.
Magnoliphyllum, xiii., 38.
Mahernia, xiii., 294.
Mahonia, xi., 58; xv., 147.
Malanthemum, xiii., 73; xiv., 237; xv., 58, 286.
Malacothrix, viii., 75; xi., 128; xiv., 16.
Malcombia, ix., 117.
Malperia, xvi., 86.
Malva, vii., 52; viii., 48; ix., 121, 149; xiv., 129, 219, 232, 261; xv., 132; xvi., 46, 132.
Malvastrum, vii., 35, 113, 123; viii., 70, 144; x., 74; xii., 35, 108; xiv. 101; xv., 214; xvi., 64, 153.
Mamillaria, x., 60, 83; xiii., 63; xv., 128; xvi., 144.
Manihot, xiv., 250; xvi., 274.
Manisurus, ix., 135; xvi., 235.
Mantellia, vii., 76.
Marah, xiv., 156; xv., 148.
Marasmius, viii., 56, 61; xiii., 175.
Marcgravia, xvi., 63.
Marchantia, xii., 109; xiii., 73, 99, 224.
Mariscus, xiii., 215; xv., 99.
Marrubium, xii., 39, 60, 80; xiv., 147; xv., 223.
Marshallia, xii., 62.
Marsilea, vii, 106; viii., 127, 144; ix., 11, 35; xi., 7, 139; xiii., 81, 82, 144, 170; xiv., 89; xv., 259.
Martynia, xiv., 207.
Maruta, ix., 114; xi., 103; xiii., 116; xiv, 147.
Masospora, xv., 171.
Mastigocladus, x., 14.
Mastogonia, xvi., 75.
Matayba, xvi., 191.
Matricaria, viii., 84, 142; ix., 150; x., 120; xiv., 16; xv., 136.
Mays, ix., 134.
Maytenus, xvi., 189.
Mazæa, x., 14.
Mecanopsis, xv., 243.
Meconella, xiii., 66, 218.
Medeola, ix., 115; x., 44; xvi., 290.
Medicago, vii., 124; ix., 149; xii., 48; xiii., 17, 23, 188; xiv., 146, 147, 151, 219; xvi., 259, 287.
Meesia, viii., 46.
Megarrhiza, vii., 101; viii., 97; xiii., 177; xiv., 60, 155; xv., 22, 148; xvi., 230.
Melaleuca, xiii., 241.
Melampodium, xv., 172.
Melampsora, xvi., 231.
Melanconis, x., 117; xiv, 242.
Melanconium, ix., 133; x., 74, 76.
Melanostoma, vii., 99.
Melanthium, vii., 26, 28, 73; ix., 35; x., 133, 135; xi., 21.
Melasmia, xvi., 196.
Melastoma, xvi., 179.

Melia, ix., 23; xvi., 47.
Melica, ix., 135; x., 8, 30, 31, 65; xii., 25, 68; xiv., 148; xv., 48, 294; xvi., 70.
Meliola, viii., 91; xv., 274.
Melissa, xiv., 127.
Melobesia, xiii., 114; xv., 314.
Melocactus, xv., 128.
Melochia, xvi., 154.
Melilotus, vii., 124; ix., 121; xii., 48, 53, 100; xiv., 261; xv., 132; xvi., 259, 269, 287.
Melinonia, xiii., 139.
Mellichampia, xiv., 168.
Menispermites, xiii., 36.
Menispermum, xi., 11; xiii., 115.
Melosira, xiv., 28, 29, 31, 58, 141; xv., 131, 183; xvi., 75.
Memecylon, viii., 116.
Meniscium, xv., 252.
Mentha, x., 120; xiv., 13; 159, 235, 262; xv., 175, 242; xvi., 24, 50, 123, 289.
Mentzelia, x., 69, 81; xi., 104; xiv., 223.
Menyanthes, vii., 59; ix., 36, 92; x., 67; xi., 92; xii., 101, xv., 133.
Menziesia, xii., 17; xiii., 73, 76.
Mercurialis, xi., 58; xii., 87.
Merceya, xv, 185; xvi., 94.
Meridion, xv., 128.
Merismopedia, xiii., 93.
Mertensia, viii., 58, 79, 81, 91; xi., 45; xii., 25, 53, 62; xiii., 13, 115, 246; xiv., 152, 186, 231, 235, 262; xv., 136; xvi., 38.
Merulius, xii., 92; xiv., 20.
Mesembryanthemum, xi., 56; xiv., 192; xv., 325.
Mesocarpus, ix., 26; xii., 127; xiii., 94; xvi., 244.
Mesogloia, xi., 29, 30; xiii., 109; xv., 312; xvi., 9, 10.
Mespilus, xvi., 310.
Metrosideros, xiii., 241.
Metzgeria, xv., 202.
Michelia, xv., 138.
Micrampeles, xv., 302; xvi., 208, 230, 288.
Microsterias, vii., 45, 91; viii., 1, 39; ix., 27; x., 18; xi., 14, 15, 16; xii., 4, 127, 128, 133; xiii., 59, 93; xv., 114, 160; xvi., 187.
Microchæte, xi., 130.
Micrococcus, xiii., 86, 146, 250; xiv., 61, 88.
Microcoleus, vii., 44; viii., 38; xiii., 105; xv., 310, 327.
Micromeria, xv.,310.
Microseris, ix., 111; x., 88; xiii., 66; xiv., 169.
Microspatha, xvi., 308.
Microsphæria, x., 75; xiii., 99; xiv., 193, 195; xvi., 196.
Microspora, xiii., 93.
Microstylis, ix., 114; x., 96; xi., 134; xvi., 134, 265.
Microthamnion, vii., 48; viii., 40.
Mikania, x., 67; xiv., 147, 164; xv., 242.
Milium, ix., 75, 135.
Milla, xv., 112.
Milocaryum, xiv., 167.
Miltonia, xvi., 141.
Mimetanthe, xiii., 43.
Mimosa, viii., 143; xv., 172; xvi., 327.
Mimulus, vii., 29, 113; viii., 120; ix., 150; x., 81, xi., 36, 68; xii., 25; xiv., 13, 104; xv., 214; xvi., 86, 176, 204.
Mimusops, ix, 142.
Mirabilis, viii., 129; xi., 67; xvi., 174.
Mitchella, viii., 111., x., 1, 3; xi., 140, xvi., 196, 288.
Mitella, viii., 46, 84; x., 46, 66; xiii., 100; xiv., 61, 79, 104, 233.
Mitraria, xv., 107, 243.
Mitremyces, vii., 114; xv., 296.
Mitrula, ix., 1.
Mnium, viii., 46; xiv., 23; xv., 186; xvi., 30, 110, 249.
Mniopsis, xvi., 312.
Mollia, (Bryophyta) xvi., 106.
Mollia, (Tiliaceæ) xvi., 156.
Mollugo, xii., 53; xiv., 164, 218.
Momordica, xiv., 155.
Monanthochloe, ix., 135; x., 8.
Monarda, vii., 12, 113, 114; xii., 39, 53; xiii., 76, 116; xiv., 186, 219; xv., 132, 302; xvi., 136.
Monardella, x., 82.
Moneses, vii., 24; viii., 46; ix., 114; xii., 17; xv., 128, 230, 235; xvi., 263.
Monilia, xvi., 231.
Monnina, xvi., 20.
Monocera, ix., 135.
Monostroma, ix., 70; xiii., 106; xv., 310.
Monotropa, vii., 62, 73; ix., 60; x., 33; xii., 101, 132; xiii., 5; xiv., 152, 235, 261, 262, xvi., 141.
Monstera, xvi., 141.
Montia, x., 96; xiv., 117.
Morchella, ix., 123; xiii., 175; xv., 326.
Moquilea, xvi., 291.
Moriconia, xiii., 35, 36.
Moringa, xvi., 282.
Morisonia, xvi., 17.
Morthiera, xiii., 87.
Morus, vii., 26; ix, 54; xii., 82; xvi., 113, 270, 311.
Moschoxylon, xvi., 189.
Mougeotia, x., 15.
Mourera, xvi., 312.
Mucronoporus, xvi., 173, 256, 337.
Mucuna, xiii., 22, 24.
Muilla, xiv., 196; xv., 242.
Muhlenbergia, vii., 18; viii., 78; ix., 77, 88, 89, 104, 135, 136; x., 121; xi., 139; xiii., 53, 231, 232, 249; xiv., 39, 99, 202; xv., 8, 49, 202, 295; xvi., 290.
Mulgedium, x., 9; xi., 102, 104, xii., 39
Munroa, ix., 135; x., 65.
Muntingia, xvi., 157.

Musa, xii., 46.
Muscari, vii., 97; xiii., 84; xiv., 53.
Museniopsis, xvi., 122.
Mutinus, vii., 30; xvi., 119.
Mutisia, xvi., 36, 174, 256.
Mycena, viii., 57.
Myginda, xiv., 21.
Myosotis, vii., 97, 125; viii., 8; ix., 117; x., 33; xi., 90; xii., 26; xiii., 189; xiv., 13, 59, 68, 235, 262.
Myosurus, xiii., 1, 2, 3, 4, 43, 60; xiv., 165.
Myriactis, xiii., 103.
Myriadoporus, xi., 27.
Myrica, vii., 19; ix., 36; xi., 91, 116, 117; xii., 93; xiii., 12, 36, 220; xiv., 207, 230, 236; xvi., 289.
Myriocarpa, xiv., 170; xv., 115.
Myriocladia, xvi., 10.
Myrionema, ix., 71; xi., 131; xiii., 108; xv., 312.
Myriophyllum, xiv., 51; xv., 19.
Myriotrichia, xiii., 108; xv., 311.
Myrsine, xiii., 36.
Myrtus, xiii., 241.
Mysodendron, xv., 108.
Mytilinidion, viii., 51.
Nabalus, viii., 11; ix., 114; x., 34; xi., 36; 102, 104.
Naias, xiii., 94, 160.
Nama, xvi., 222.
Narcissus, viij., 60; ix., 106; x., 11.
Nardosmia, ix., 84; xi., 104; xvi., 329.
Narthecium, vii., 73, 93.
Nasturtium, vii., 11, 27; viii., 119; xi., 47, 56, 91; xiii., 83; xiv., 150; xvi., 132, 266.
Navarretia, xv., 25; xvi., 176.
Navicula, xiv., 27, 31, 58, 69, 109, 141, 175; xv., 129. 131, 183; xvi., 75, 98, 209, 223.
Neckera, xiii., 121; xv., 186; xvi., 111, 307.
Nectandria, xvi., 282, 310.
Nectria, ix., 20; x., 77; xi., 74.
Neea, xvi., 174.
Negundo, vii., 27, 73; ix., 54, 156; x., 79; xii., 100, 101; xiii., 74, 117; xiv., 178; xv., 135; xvi., 310.
Neillia, xiii., 6; xiv., 184; xvi., 58.
Nelumbium, vii., 29, 101; x., 135; xi., 91; xii., 40; xiii., 45, 94, 177; xiv., 201, 215, 241; xvi., 141.
Nelumbo, xiv., 215, 228; xv., 176; xvi., 141, 338.
Nemacaulis, xiii., 42; xiv., 217, 228.
Nemalion, x., 55; xiii., 110; xvi., 5.
Nemastoma, xvi., 5.
Namastylis, xvi., 86.
Nemopanthes, x., 105; xiv., 232; xvi., 123, 202, 289.
Nemophila, viii., 75; x., 119.
Neopeckia, x., 127.
Nepenthes, vii., 49; xii., 90; xiii., 138.
Nepeta, xiv., 235; xvi., 50.
Nephrocytium, xiii., 93.
Nephrodium, xiv., 170; xv., 143, 225, 242, 251.
Nephrolepis, viii., 79; xii., 48; xiv., 149.
Nephroma, xii., 88.
Nereocystis, ix., 144; xvi., 7, 8.
Nerium, xi., 11: xii., 48.
Nessea, vii., 19, 29, 69; xii., 56; xiii., 94; xvi., 315, 333, 340.
Nestia, viii., 141.
Neurolena, xvi., 120.
Neuropteris, xvi., 173.
Nephrodium, viii., 89.
Nicandra, vii., 115; xii.; 39.
Nicotiana, xii., 48, 108; xiii., 176; xiv., 44; xv., 110; xvi., 47.
Nidularia, xi., 18.
Nigella, xv., 223.
Nitella, vii., 106; viii., 67; ix., 35, 37; xiv., 132, 211, 214; xv., 11, 91; xvi., 204.
Nitzchia, xiv., 28, 142; xv., 129, 131.
Nodularia, ix., 7; xi., 130; xiii., 105; xvi., 182, 188.
Noggerathia, vii., 75.
Nolina, vii., 79; x., 106.
Northoscordum, xiv., 164.
Nonea, xi., 54, 55.
Normandina, xiv., 222.
Nostoc, xii., 117; xiii., 93; xiv., 61; xv., 161.
Nothocalais, xiii., 66.
Nothoklæna, vii., 50, 63, 64, 85, 86; viii., 36, 61; ix., 5, 22, 69, 99; x., 27, 133; xi., 48; xii., 21, 23, 116; xiii., 82, 131, 132, 177, 227; xiv., 168; xv., 68, 229, 252.
Nowodworskia, ix., 77.
Nummularia, xi., 74, 75; xiv., 138; xv., 202, 242; xvi., 174.
Nuphar, vii., 29, 51; x., 34; xii., 15, 52; xiii., 94, 177; xiv., 176, 177, 241, 257; xv., 29, 51, 84.
Nuttallia, xv., 243.
Nymphæa, vii., 29; viii., 119, 120; ix., 142; x., 45, 46, 106; xi., 90, 134; xii., 15, 32, 65; xiii., 83, 94, 98, 252; xiv., 35, 39, 87, 88, 153, 177, 186, 215, 257; xv., 13, 28, 29, 51, 84, 127, 135, 235, 299; xvi., 169, 228, 287, 338.
Nyssa, vii., 101; viii., 73, 113; x., 67; xi., 17; xii., 82; xiii., 13; xiv., 108; xvi., 199, 310.
Oakesia, x., 33; xi., 98; xiv., 176.
Obione, ix., 156.
Obolaria, vii., 49; xiii., 4; xiv., 138; xv., 204.
Ochroma, xvi., 154.
Ocimum, xiv., 127.
Ocotea, xvi., 282.
Odonectis, xii., 37.
Odynerus, viii., 136.
Œdogonium, vii., 47; viii., 40; x., 14; xii., 125, 126; xiii., 94; xvi., 182.
Œnothera, ix., 19, 36, 117; x., 41, 125; xi., 35; xii., 48, 62; xiii., 189, 246; xiv., 12, 196, 233; xv., 132, 214; xvi., 34, 135, 205, 314.
Oldenlandia, viii., 120.
Olea, xiii., 13.

Ombrophila, viii., 74; ix., 73.
Omphalaria, xiii., 149.
Omphalodes, xii., 11.
Ompholodium, viii., 140; ix., 12.
Oncidium, xvi., 230, 256.
Oncoba, xvi., 19.
Onobrychis, xiv., 267; xv., 223, 241.
Onoclea, viii., 101, 109; ix., 6; x., 9, 119; xi., 8; xii., 8, 9, 110; xiii., 49, 52, 227; xiv., 68, 242; xv., 86, 136; xvi., 134, 329.
Ononis, vii., 123.
Onopordon, vii., 124.
Onosmodium, viii., 130; xvi., 135.
Onychonema, xii., 133.
Oocystis, ix., 25.
Opegrapha, xiv., 152; xvi., 199.
Ophiocaryon, xvi., 146.
Ophiobolus, ix., 19.
Ophiocytium, vii., 44; x., 15.
Ophioglossum, vii., 89; viii., 79, 101; ix., 36, 50, 55, 71, 116; x., 67; xi., 7; xii., 23.
Oplismenus, ix., 134; xii., 48; xvi., 231.
Opuntia, vii., 26, 101, 114; ix., 60, 156; x., 79, 81, 83, 119, 123; xi., 135, 139; xii., 48, 77, 97, 121, 133; xiii., 63; xiv., 241; xv., 55, 128, 212, 241; xvi., 121, 256.
Orcadella, xvi., 338.
Orchis, vii., 49; xi., 83; xiii., 4, 61; xiv., 153; xv., 55, 204, 321.
Orcuttia, xiii., 219.
Oreocarya, xiv., 191.
Oreodaphne, xiv., 162.
Oreodoxa, ix., 50; xii., 47.
Oreoxis, xvi., 122.
Origanum, vii., 53, 125.
Ornithopus, vii., 124.
Ornithogalum, ix., 36; xii., 68; xiv., 53; xv., 202.
Orobanche, vii., 62, 125.
Orogenia, xiv., 169.
Orontium, vii., 27; viii., 7; ix., 98, 115, 116; xi., 91, 127; xiv., 187; xvi., 52.
Orothecium, xv., 186
Orthocarpus, xi., 67; xiii., 43.
Orthopogon, ix., 134.
Orthosira, xiv., 142.
Orthotrichia, xiii., 250.
Orthotrichum, vii., 8; xiii., 190; xvi., 109, 331.
Oryza, viii., 120.
Oryzopsis, vii., 114; viii., 28; ix., 135, 136; x., 63; xv., 49, 297; xvi., 290.
Oscillaria, vii., 43; ix., 25; xii., 117, 129; xiii., 93, 99, 105; xiv., 65; xv., 310; xvi., 172.
Osmanthus, xiii., 178.
Osmorrhiza, vii., 87; xi., 92.
Osmunda, viii., 47, 101, 110; ix., 100, 101, 129; x., 9, 33, 59; xi., 8; xii., 103; xiii., 7, 62, 86; xiv., 12, 238, 249; xv., 43, 107, 189; xvi., 329.
Ostrya, xii., 82; xiv., 190; xv., 265.
Ostryopsis, vii., 120.
Otanthera, viii., 35.
Otozamites, vii., 77.
Ouratea, xvi., 160.
Ourisia, xv., 110.
Ouvirandra, xiii., 154.
Oxalis, vii., 123; ix., 114; xii., 48, 103; xiii., 120; xiv., 145, 148, 184, 223, 239; xv., 17, 113, 135, 182, 199, 243, 299; xvi., 45, 159, 265.
Oxybaphus, xv., 55; xvi., 24, 38, 206.
Oxycoccus, xiii., 204; xv., 128; xvi., 269.
Oxydendron, xii., 17; xiii., 74.
Oxydenia, ix., 135.
Oxypetalum, xvi., 168.
Oxytheca, ix., 32 143. x., 28.
Oxytropis, viii., 70; xii., 26; xiv., 61, 128; xv., 138, 214; xvi., 203, 229.
Pachyma, ix., 125, 126.
Pachyphyllum, xvi., 298.
Pachyrhizus, xvi., 324.
Paeonia, xiii., 238.
Palmanthus, xiii., 37.
Palmella, ix., 70, 94.
Palmerella, xvi., 200.
Palmodactylon ix., 25.
Palmoxylon, xvi., 175.
Paltonium, viii., 89.
Pamphalea, xiv., 159.
Pamya, xiii., 143.
Pandanus, xiii., 37; xiv., 145; xv., 73.
Pandorina, viii., 39; xv., 156.
Panicum, vii., 82; viii., 28, 120; ix., 75, 134, 135, 136, 151; x., 8, 35, 36, 63, 85, 121; xi., 61, 62; xiii., 25, 26, 39, 46, 84, 249; xiv., 82, 95, 151, 262; xv., 173; xvi., 36, 121, 134, 290.
Pannaria, xiv., 222.
Panus, xiii., 126; xv., 143.
Papaver, vii., 123; xi., 21, 35; xii., 48, 90; xiii., 83; xiv., 80, 100; xv., 243.
Pappophorum, ix., 135, 147, 148.
Pardanthus, xi., 93, 139; xv., 235.
Parkinsonia, xvi., 310.
Parmelia, viii., 120, 141; ix., 142, 152; xiv., 248; xv., 114, 172, 184; xvi., 30, 249.
Parmeliella, xvi., 87.
Parmeliopsis, xiv., 222.
Parnassia, vii., 59, 114; viii., 46; xi., 84, 92; xii., 95; xiv., 220, 233.
Paronychia, xiii., 70; xiv., 219; xvi., 205.
Paspalum, vii., 93, 126; ix., 74, 75, 134, 135; x., 35, 63; xiii., 162; xiv., 151, 161; xvi., 70, 231.
Passiflora, xiii., 31 115; xv., 243; xvi., 175.
Pastinaca, vii., 87; xiii., 67.
Pattalias, xvi., 86.
Patellaria, viii., 74; ix., 7, 8; xvi., 87.
Paullinia, xvi., 190.
Paulownia, xii., 39; xiii., 4, 239; xvi., 260.
Pavia, xv., 243.
Pavonia, vii., 123; xvi., 154.
Paxillus, ix., 18; xii., 33; xv., 91.
Pechea, ix., 135.
Pecopteris, vii., 76; xiv., 171.

Pectocarya, x., 69.
Pedalium, xv., 300.
Pediastrum, ix., 25; xi., 96; xiii., 93; xvi., 183.
Pedicularis, xii., 25; xiv., 67.
Pelagophycus, xvi., 7.
Pelargonium, xiv., 220.
Pellæa, vii., 28, 50, 63, 85, 94, 95; viii., 5, 32, 36, 89; ix., 5, 91, 92, 50, 68, 69; x., 28; xi., 48; xii., 23; xiii., 70, 81, 82, 88, 133, 134; xiv., 181; xv., 222., 229, 249; xvi., 57.
Pellia, xvi., 79.
Peltandra, ix., 116; xi., 90.
Peltidea, xii., 88.
Peltigera, xii., 88; xiii., 149.
Pelucha, xvi , 86.
Penicillium, xvi., 116, 121.
Penium, viii., 39; xi, 15; xii., 1, 133; xiii., 59; xv., 158; xvi., 25, 185.
Pennicillaria, ix., 136.
Pennisetum, ix., 134, 136; x., 85.
Pentachæta, ix., 109; xiv., 102.
Pentstemon, vii., 27; viii., 76; x., 127; xi., 8, 73, 122, 130, 140; xii., 35; xiv , 198; xv., 132, 150, 200, 204, 214, 276; xvi., 35, 148, 150, 176, 204.
Peperomia, xiv., 68.
Pereskia, xv., 198.
Perezia, xi., 129; xv., 180.
Periclymenum, x., 95.
Periconia, xi., 50.
Perilla ix., 150.
Peronospora, vii., 34; xi., 64; xii., 108, 109; xiii., 85, 170, 176, 191, 224; xiv., 34, 245; xvi., 171, 196.
Pernettya, xv., 18, 106, 107.
Persea, xii., 76.
Pertusaria, viii., 141; ix., 12; xvi., 87, 199.
Pestalozzia, ix., 133; xiv., 244.
Petalostemon, viii., 93; x . 35; xii., 53; xvi , 70.
Petasites, xi., 104; xiv., 261.
Petrocelis, x., 56.
Petunia, xiii., 84; xiv., 44.
Peucedanum, vii., 61, viii., 75; xiv., 169, 241; xv., 24, 174. 224, 246; xvi., 122.
Peysonnelia, xiii., 110.
Peziza, vii., 84; viii., 65, 66, 73, 123; ix., 18, 19, 73, 112; x., 52, 76, 93; xi., 18, 41, 74, 95; xii., 37; xiii., 86, 176
Phacelia, viii., 75, 122; x., 81, 102; xi., 12, 50, 68; xiii., 126; xiv., 102. 104, 195; xv., 17, 25, 114, 128. 243, 299; xvi., 283.
Phacidium, ix., 7, 8.
Phænicaulis, xiii., 143.
Phæosaccion, ix, 66.
Phajus, xv., 176.
Phalaris, vii., 27, 29; ix., 23, 87, 135, 151; x., 8; xii., 40; xiv., 151; xvi., 70.
Phallus, vii., 11, 32, 33; viii., 96; ix., 123, 124; xi., 70; xv., 315.
Phanerophlebia, x., 29.
Phanlothamnus, xii., 11.
Pharus, ix., 134; x., 35.
Phascum, vii., 7; xv., 114; xvi., 30, 249.
Phaseolus, vii., 19; viii., 120; xi., 125; xiii., 17, 18, 20, 22, 24, 138; xiv., 127, 241; xvi., 51, 242, 324.
Phegopteris, vii., 63, 118, viii., 60; ix., 22, 50; x., 101; xi , 8, 36, 67; xiii., 74; xiv., 238; xv., 229, 251, 264; xvi., 290.
Philadelphus, vii., 59; x., 69; xiii., 237; xiv., 195, 196, 243; xv., 224; xvi , 270.
Philesia, xv., 107.
Philodendron, xvi., 220.
Philonotis, xv., 185; xvi., 110.
Phippsia, ix., 135; xiii., 42.
Phleospora, xiv., 196; xv., 145.
Phleum, vii., 61, 118, 125; ix., 135; x., 63; xi., 120; xii., 25; xvi., 290.
Phlomis. xv., 326.
Phlox, vii., 12, 26, 49, 82, 113; viii., 125; ix., 6; x., 9; xii., 25; xiii., 115; xiv., 102; xv., 25, 173, 243, 326.
Phlyctæna, xiv., 196.
Phœnix, ix., 83.
Pholisma, x., 106; xvi., 333.
Phoma, vii., 90; viii , 125; x., 89; xi., 73; xiv., 244; xv., 54; xvi., 31, 204.
Phoradendron, vii., 101; xi., 76, 87; xiii., 13; xiv., 108; xvi., 244, 311.
Phorima, xii., 37.
Phormidium, vii , 43; viii., 38; ix., 25; xii., 129.
Phragmidium, xv., 55; xvi., 196.
Phragmites, viii., 120; ix., 135; x., 8, 65; xvi., 290.
Phryma, vii., 18; xi., 115; xiii., 95; xvi , 289.
Phyllactidium, xv , 327.
Phyllactinia, xiv., 193; xv., 55.
Phyllanthus, vii., 119, 125; xi., 47; xiv., 162.
Phyllepidium, xii., 37.
Phyllitis, xiii., 107; xiv., 4, 172; xv., 311.
Phyllophora, x., 56; xiii., 111; xv., 313, 314.
Phyllospadix, xiii., 160.
Phyllosticta, x , 49, 97; xi., 115; xiii., 65; xiv., 244; xv., 54, 145; xvi , 231.
Physalacria, ix., 2, 4.
Physalis, ix., 122, 150; x., 81; xi., 42; xiv., 79, 164, 219; xv., 219; xvi., 144.
Physalospora, xiv., 15, 38, 207, 245; xvi., 121.
Physarella, ix., 61, 62.
Physarum, ix., 61; xi., 50.
Physcomitrium, xv,, 185; xvi., 94.
Physcia, x., 43; xv., 172, 184.
Physcidia, xiv., 222.
Physianthus, xvi., 58.
Physostegia, vii., 19; viii., 28; xii., 39; xv., 302.
Physostigma, xiii., 21, 23, 24.
Phytolacca, x., 90; xiii., 225; xiv., 148; xvi., 289.
Phytonomus, xiii., 30.
Phytophthora, xiv., 245; xvi., 231.
Phytoptus, xvi., 339.

Picea, ix., 80; x., 47; xi., 65; xii., 94, 75; xiii., 88, 126; xiv., 195; xv., 128, 136; xvi., 121, 227, 290, 311.
Picramnia, xvi., 160.
Picridium, xv., 223.
Picris, vii., 125, xi., 35; xvi., 94.
Pilocarpus, xiv., 56.
Pilularia, xiv., 23; xv., 259; xvi., 138.
Pimpinella, xiv., 79.
Pinguicula, x., 35; xii., 100.
Pinnularia, xiv., 70, 71, 72, 73, 109; xvi., 99, 100.
Pinus, vii., 14, 25, 39–43, 72, 102, 105; viii., 6, 23, 46, 71; ix., 80, 106, 108, 156; x., 33, 47, 82, 93, 94, 105, 106, 107, 118, 122, 132; xi., 22, 23, 40, 97, 99, 100, 101, 128; xii., 94, 41, 42, 50, 61, 65, 66, 68, 75, 81, 93, 94, 114, 132; xiii., 5, 35, 64, 70, 99, 121, 122, 148, 150, 178, 183, 193, 203, 245; xiv., 81, 88, 129, 153, 189, 200, 241, 247; xv., 114, 128, 136, 243, 244, 306; xvi., 88, 90, 137, 142, 163, 167, 172, 179, 194, 199, 256, 290, 294, 311, 338.
Pirus, ix., 149.
Pistia, x., 108.
Pistillaria, ix., 1.
Pisum, xiii., 17; xvi., 242.
Piper, xvi., 309.
Piptadenia, xvi., 326.
Piptocalyx, xiv., 191.
Pitcairnia, viii., 118; xv., 224, 242; xvi., 168.
Pithecolobium, xvi., 310, 327.
Pithophora, x., 13; xii., 126; xiii., 65.
Plagiochaila, xiii., 180.
Plagiogramma, xvi., 209.
Plagiospermum, x., 15.
Plagiothecium, vii., 8.
Plagiobothrys, xii., 11; xiv., 100, 150.
Placodium, xiii., 149; xvi., 198.
Plantago, vii., 67, 68, 96, 125; ix., 10, 36, 74; xi., 75; xii., 48; xiii., 61, 73, 95, 187, 246; xiv., 77, 145, 147, 148, 200, 231, 236; xv., 136; xvi., 70, 231, 289.
Plasmodiophora, xiv., 199.
Platanus, vii., 80, 108; ix., 54, 56, 78, 96; xi., 47; xiii., 126, 247; xv., 146, 208; xvi., 256, 257.
Platanthera, vii., 83.
Platygrapha, xvi., 203, 330.
Platystemon, xiii., 218, 224; xvi., 339.
Platysticta, xvi., 203.
Platystigma, xiii., 218.
Plectritis, viii., 81.
Pleonectria, x., 49.
Pleospora, viii., 125; x., 53; xi., 75; xvi., 204.
Pleuchea, viii., 120
Pleuraphis, ix., 32, 86, 135, 136.
Pluerocarpus, vii., 47; xi., 15; xvi., 184.
Pleurococcus, xi., 101., 102.
Pleuropogon, ix., 135, 137; x., 65.
Pleurosigma, xiv., 67, 99, 31; xv., 130, 131, 183; xvi., 75.
Pleurotænium, vii., 44; viii., 4.
Pleurotis, xiv., 244; xvi., 202.
Plocamium, xv., 19.
Plœospora, ix., 70.
Pluchea, xi., 103; xiv., 44.
Pluteus, xii, 124.
Poa, vii., 126; ix., 72, 135, 151; x., 8, 31, 65, 66, 77; xi., 126; xii., 25; xiii., 76; xiv., 94, 151, 221; xv., 11, 49; xvi., 206, 231.
Podaxon, vii., 58; viii., 34; ix., 2.
Podistera, xiv., 160.
Podocarpus, xvi., 13.
Podophyllum, vii., 11; viii., 7; ix., 10, 140; x., 49; xi., 62; xii., 12; xiii., 83, 101, 114, 115; xiv., 80, 120, 140; xv., 214; xvi., 244.
Podosæmum, ix., 88.
Podosciadium, x., 60.
Podosira, xiv., 32; xvi., 75.
Podosphæra, xiv., 193, 195; xvi., 231.
Podostemon, xvi, 312.
Podozamites, vii., 77; xii., 91, 92; xiii., 35.
Pogogyne, xv., 114.
Pogonatum, xvi., 95, 110, 307.
Pogonia, vii., 113; viii., 108, 114; x, 9, 67; xiii., 5; xiv., 12, 154; xv., 243; xvi., 38.
Pogonopus, xvi., 227.
Pohlia, xvi., 110.
Polanisia, xiii., 60, 117; xiv. 223.
Polemonium, viii, 6, 75; ix., 72; x., 9; xii., 53; xiii., 115; xiv., 184, 262; xv., 24, 128, 328.
Polia, xiv., 159.
Polycarpon, x., 82.
Polycystis, xv., 310.
Polyedrium, ix., 26; x., 15; xvi., 183.
Polygala, vii., 82; viii., 92, 115, 120; ix., 24; x., 35, 120, 125; xi., 12; xii., 100, 101; xiii., 5, 12, 70, 75, 126, 220; xiv., 128, 160, 186, 187, xv., 132; xvi., 19, 179, 312.
Polygonatum, vii., 49, 54; xiv., 86, 186.
Polygonastrum, xv., 285.
Polygonum, vii., 28, 54, 57, 125; viii., 23, 28, 48, 99, 106, 120; ix., 35, 73; x., 107, 121; xii., 25, 40, 103; xiii., 5, 6, 61, 94, 117; xiv., 14, 44, 86, 153, 164, 236, 252; xv., 136; xvi., 38, 169, 256, 286, 289.
Polyides, xiii., 112.
Polymnia, x., 9.
Polypodum, vii., 26, 85, 94, 97; ix., 22, 49, 151; x., 26, 33, 59, 101; xi., 7, 48, 132; xiii., 81, 117; xiv., 16, 37, 108, 164, 181; xv., 229, 251; xvi., 58, 290, 312, 329.
Polypogon, viii., 76; ix., 77, 134, 153; x., 8, 64.
Polyporus, vii., 102–105; viii., 20, 34, 51; ix., 120; xi., 26, 27; xii., 29; xiii., 14, 32, 64, 151, 175, 193; xiv., 94, 130, 221; xv., 115, 184; xvi., 173.
Polypteris, xi., 128.
Polysiphonia, xi., 29, 30; xiii., 113, 114; xiv., 28; xv., 314; xvi., 6.
Polystichum, see Aspidium.
Polystictus, xvi., 202.

Polystigma, xvi., 26.
Polytænia, vii., 87.
Polytoma, xiii, 102.
Polytrichum, ix., 133; xiv., 250; xv., 186, 243; xvi., 96, 110, 250.
Pontederia, vii., 97; viii., 125; xi., 90; xiii., 94; xiv., 159; xvi., 242, 290.
Populus, vii., 25, 57, 107; viii., 22; ix., 8, 79, 106; ix., 156; x., 33, 123; xi., 22, 23; xii., 24, 75, 82, 94; xiii., 89, 90, 91, 107, 195, 233; xiv., 114, 132, 230, 236; xvi., 121, 290.
Porella, xvi., 79.
Porphyra, ix., 70; xi., 131; xiii., 109; xv., 19.
Porphyridium, viii., 40; xvi., 184.
Portlandia, xvi., 175.
Poseidonia, xiii., 159.
Potamogeton, vii., 18, 27, 71, 116; viii., 21, 59, 120; ix., 34, 36, 150; x., 92, 107, 121; xi., 32; xii., 19, 26, 40; xiii., 94, 95, 97, 145, 154, 171, 252; xiv., 52, 237, 243; xv., 94, 296; xvi., 36, 88, 120, 124, 134, 256, 264, 290, 312.
Portulaca, viii., 115; ix., 5, 153; xi., 106; xiv., 101, 147, 262; xv., 246; xvi., 62, 145.
Potamogeton, xi., 90, 91; xiii., 84.
Potentilla, vii., 19, 28, 93, 124; viii., 23, 47, 97; ix., 23, 36; x., 9, 36, 46; xi., 92, 99, 100, 128, 139; xii., 24, 26, 53, 94, 103; xiii., 6, 73, 188, 189, 195, 246; xiv., 230, 232, 233, 252, 261, 263; xv., 58, 93, 243; xvi., 70, 149, 151, 205, 221, 287, 312.
Poterium, vii., 194; xi., 36; xiv., 233.
Pottia, xv., 186; xvi., 107.
Prasiola, viii., 40; ix., 25, 66.
Prenanthes, xi., 102, 104; xiii., 73; xiv., 234; xv., 136, 301; xvi., 288, 329.
Primula, viii., 81, 122; ix., 139; xi., 130; xii. 39; xv., 276; xvi., 35.
Pringleophyton, xii., 11.
Prionosciadium, xv., 200.
Prionitis, xv., 184.
Prochnyanthes, xiv., 168.
Prockia, xvi., 157.
Prodorus, xiii., 141.
Prodoxus, xiii., 139.
Pronuba, xiii., 141.
Propolis, viii., 65, 194.
Prosartes, xi., 36; xv., 188.
Proserpinaca, vii., 27.
Prosopis, ix., 54; x., 122; xiv., 161, 241; xv., 179; xvi., 86.
Protium, xvi., 189.
Protococcus, ix., 94; x., 15, 136; xiii., 86, 87, 99; xvi., 30, 35.
Protophyllium, xiii., 98.
Protosalvinia, xv., 300.
Prunus, vii., 114; viii., 29, 48, 70; ix., 53, 149, 156; x., 44, 81; xi., 11, 83, 92, 108, 127; xii., 39, 82, 85, 86; xiii., 36, 83, 94; xiv., 187, 191, 206, 207, 230, 232; xv., 174, 175, 267, 288, 327; xvi., 287.
Psamma, ix., 135.
Pseudauliscus, xvi., 75.
Pseudocymopterus, xvi., 122.
Pseudophœnix, xiv., 21; xv., 276; xvi., 58.
Pseudotsuga, ix., 79, 106; x., 42, 47; xii., 24; xiv., 196; xvi., 203.
Psilocarya, xv., 101.
Psilophyton, vii., 75.
Psilotum, ix., 128; xiii., 135; xiv., 244.
Psoralea, xiv., 40, 241; xvi., 70, 259, 279.
Psoroma, xiv., 222.
Ptelea, xi., 10, 12; xiii., 126; xiv., 167, 196; xv., 299; xvi., 310.
Pteris, vii., 60, 85, 114; viii., 88; ix., 69, 129; x., 59; xi., 7; xiii., 117; xiv., 181, 231; xv., 136, 249; xvi., 290.
Pterocarpus, xv., 138; xvi., 324, 325.
Pteropsis, viii., 89.
Pterostegia, xiii., 147; xvi., 277.
Ptilocalais, xiii., 66; xvi., 150.
Ptilonia, xv., 19.
Ptilota, xi., 30; xiii., 111; xv., 19, 313.
Ptychomitrium, vii., 5; xvi., 109, 225.
Puccinia, viii., 86, 125; ix., 133; xi., 32, 49, 58, 64, 65, 93; xii., 34, 35, 44, 108; xiv., 20; xv., 119, 149, 257; xvi., 84, 122, 196.
Pulmonaria, x., 83.
Punctaria, xiii., 107; xv., 311.
Purshia, xii., 37.
Puya, xvi., 306.
Pycnanthemum, vii., 18, 53, 121; viii., 130; x., 9; xii., 39; xvi., 133, 247.
Pylaisea, xv., 186, 201.
Pyrenophora, xi., 28.
Pyrenothamnia, x., 22; xi., 25.
Pyrenula, xii., 62; xiv., 249; xvi., 330.
Pyrola, vii., 19; ix., 114; x., 33; xi., 36; xii., 17, 20; xiii., 250; xv., 128, 136, 230; xvi., 133, 263, 289.
Pyrrhopappus, xv., 214.
Pyrularia, xiii., 74.
Pyrus, viii., 86; ix., 36, 149; x., 45, 67, 121, 136; xi., 36, 128; xii., 39, 85, 109; xiii., 94, 176; xiv., 230, 233; xv., 58, 200, 276; xvi., 287.
Pyxidanthera, xiv., 87, 108; xvi., 194.
Pyxidicula, xvi., 75.
Pyxine, xiv., 222.
Quamoclit, xiv., 164.
Quercus, vii., 12, 14, 70, 82, 101, 108, 113, 114, 115; viii., 7, 11, 23, 50, 65, 126, 132; ix., 10, 13, 15, 16, 55, 57, 78, 106, 111, 118, 152, 156; x., 9, 25, 91, 105, 106, 121, 122; xi., 24, 40, 42, 73, 90, 99, 108, 117, 118, 120, 127; xii., 40, 82, 90, 115, 119, 124, 132; xiii., 12, 40, 41, 65, 69, 74, 78, 79, 95, 117, 126, 150, 200, 202, 203, 225, 233, 250; xiv., 6, 81, 105, 171, 185, 187, 188, 190, 195, 226, 241, 247; xv., 51, 150, 275, 303, 327; xvi., 36, 58, 60, 105, 123, 133, 145, 177, 194, 289, 311, 334.
Quesnelia, xvi., 227.

Queria, xiii., 185.
Quirna, xvi., 63.
Quillaia, xi., 95.
Racomitrium, xv., 185, 243; xvi., 93.
Radula, xv., 202; xvi., 79.
Rafflesia, xiii., 37; xvi., 146.
Raillardella, ix., 17.
Ralfsia, x., 56; xv., 312.
Ramelina, x., 43; xv., 184.
Ramularia, xi., 122; xv., 56; xvi., 196.
Ranunculus, vii., 27, 28, 49, 113, 123; viii., 8, 46, 53, 59, 129; ix., 10, 24, 34, 141, 149, 156; x., 33; xi., 54, 57, 84, 91; xii., 25, 26, 37, 48, 52, 89, 103; xiii., 5, 6, 45, 65, 66, 94, 96, 187, 189; xiv., 14, 22, 53, 116, 118, 166, 186, 231, 245; xv., 19, 94, 105, 132, 273, 321; xvi., 28, 44, 150, 264, 272, 287.
Raphanus, x., 10; xii., 48; xiv., 231; xv., 210, 246; xvi., 13.
Raphidium, xiii., 93; xv., 157.
Raphidodiscus, xvi., 175, 204.
Rapistrum, xiii., 83.
Raula, vii., 16.
Ravenelia, xiii., 225.
Reaumeria, xiii., 252.
Redfieldia, xiv., 133; xv., 294.
Reimeria, ix., 134, 135; xvi., 231.
Remizia, xvi., 175.
Rengifa, xvi., 63.
Reseda, viii., 114; x., 120; xii., 38.
Reverchonia, vii., 112.
Reynosia, x., 35.
Rhabdocarpus, xvi., 173.
Rhabdonia, xi., 29; xiii., 112; xv., 313.
Rhabdonema, xiv., 32, 141; xv., 131; xvi., 71, 75.
Rhabdospora, xiv., 196, 244.
Rhamnus, ix., 36; xi., 107; xii., 62; xiii., 86, 177; xiv., 128, 129, 196, 249; xv., 24, 93, 204; xvi., 56, 189, 205, 310, 339.
Rhaphoneis, xiv., 32, 175; xv., 131; xvi., 72, 76, 209.
Rhaphidium, xvi., 184.
Rhaphidophyllum, xi., 60.
Rheum, xii., 90.
Rhexia, viii., 102; xvi., 60, 288, 340.
Rheedia, xvi., 63.
Rhinanthus, viii., 135; ix., 23; xiii., 189; xiv., 235.
Rhinotrichum, xi., 18.
Rhizoclonium, vii., 47; viii., 40; xi., 130; xiii., 106; xv., 311; xvi., 182.
Rhizoctonia, xi., 17.
Rhizomorpha, xiv., 105.
Rhizophora, xii., 47.
Rhizosolenia, xvi., 76.
Rhododendron, vii., 28; viii., 92; xi., 10, 84; xii., 17, 20, 65; xiii., 73, 76, 204; xiv., 188; xv., 56, 115, 164, 276, 300, 328; xvi., 220, 230.
Rhodomela, xiii., 113.
Rhodora, x., 105; xi., 106; xv., 91, 234.
Rhodymenia, xi., 139; xiii., 112; xiv., 220; xv., 19, 313.
Rhoicosphema, xv., 131.
Rhus, vii., 37, 91, 97, 98; viii., 144; ix., 98, 149, 153; x., 78, 79, 136; xi., 56; xii., 82, 100; xiii., 32, 67, 70, 83, 148, 179, 251; xiv., 105, 190, 192, 230, 232, 265; xv., 135; xvi., 287, 310, 339.
Rhynchosia, vii., 124; viii., 120.
Rhynchospora, vii., 12; viii., 120; x., 67; xi., 92; xiii., 61; xv., 101, 104, 320; xvi., 57.
Rhytisma, xiv., 80.
Rhytoglossa, xiii., 117.
Ribes, vii., 11, 107; viii., 68, 69, 121, 136; x., 9, 83; xii., 36; xiii., 189, 194, 233, 238, 246; xiv., 61, 104, 190, 196, 233; xv., 106, 276, 299; xvi., 283, 287.
Ricardia, xvi., 2.
Riccia, vii., 64; xv., 202.
Richardia, viii., 132; xii., 48; xiv., 108.
Richardsonia, vii., 113, 124; xiv., 151.
Ricinus, vii., 97.
Rinodina, xvi., 199.
Ripidium, ix., 135.
Ripogonum, xi., 56.
Rivularia, viii., 38; ix., 69; xiii., 93, 106; xv., 310.
Robinia, vii., 52, 92; ix., 20, 112; xi., 64; xiii., 117, 194, 233, xiv., 199; xv., 24, 219, 276; xvi., 47, 242.
Roccella, x., 43.
Rœstelia, viii., 71, 85; x., 74; xiii., 179; xvi., 196, 231.
Romanzoffia, xi., 36.
Romneya, xv., 327.
Rondeletia, viii., 71.
Rosa, viii., 91; ix., 97, 127, 156; xi., 36, 84, 91; xii., 44, 89; xiii., 14; xiv., 108, 196, 233, 243; xv., 214, 326; xvi., 70, 88, 132, 142, 161, 283, 339.
Rothrockia, xii., 11.
Rottbœllia, ix., 135, 136; xv., 117; xvi., 234.
Roubieva, vii., 73; viii, 142.
Rourea, xvi., 192.
Rubus, vii., 11, 52, 56, 71, 92; viii., 44, 70, 90, 129, ix., 24, 98; x., 33, 48; xi., 36, 73; xii., 39, 101; xiii., 179, 189, 246; xiv., 22, 230, 232, 250; xv., 219, 276; xvi., 52, 123, 217, 287, 329.
Rudbeckia, viii., 48, 93; ix., 114; x., 36; xi., 35, 94, 119; xii., 100, 101, 116; xiii., 72, 117, 189; xv., 127, 219; xvi., 205.
Ruellia, xiii., 70; xvi., 283.
Rumex, vii., 18; viii., 65; ix., 150; x., 120; xii., 36, 40, 48, 87, 103; xiv., 147, 236, 245; xvi., 44, 145.
Rupinia, vii., 34.
Ruppia, xii., 26; xiii., 159; xiv., 40.
Russelia, xv., 243.
Russula, viii., 57, 58; xiv., 130; xvi., 333.
Sabal, xi., 69; xii., 47, 72; xiii., 101; xv., 58, 234.
Sabbatia, vii., 114; viii., 28; xii., 37, 39; xiii., 5; xiv., 196; xvi., 133.
Saccharomyces, xi., 102; xv., 116.

Saccharum, xvi., 233.
Saccorhiza, ix., 71.
Sageretia, xvi., 205.
Sagina, vii., 114; viii., 23; ix., 149; x., 96; xii., 103; xiv., 147.
Sagittaria, vii., 28; ix., 4; x , 9; xii., 40; xiii., 94; xiv., 237; xv , 328; xvi., 44.
Salicornia, viii., 71, 130.
Salisburia, vii., 1, 79; xi., 134, 140; xii., 79, 92.
Salix, vii., 55, 56, 89; viii., 23, 29, 76, 84; ix., 82, 89, 90, 142, 156; xi., 24, 35, 91; xii., 24, 26, 100; xiii., 36, 84, 233; xiv., 161, 162, 186, 236, 246; xv., 116, 121, 203, 294, 246, 321; xvi., 22, 36, 39, 134, 145. 211, 232, 290.
Salpichroma, xvi., 175.
Salpiglossis, xi., 35.
Salsola, viii., 120, 130; xv , 136; xvi., 70.
Salvia, vii., 125; viii., 69; xii., 48; xiii., 70, 195; xiv., 67; xv. 94.
Salvinia, xiii., 45, 102, 171; xv., 112, 250, 262.
Sambucus, vii., 26, viii. 75; x., 105; xi., 103, 139; xii., 82; xiii., 189, 238; xiv., 230, 233; xv., 55; xvi., 52, 270, 288.
Samolus, viii., 120; x., 35; xiii., 70; xiv., 147, 159.
Sanguinaria, x., 71; xii., 12, 100; xiii., 114; xiv., 74, 140, xv., 214.
Sanicula, vii., 87; x., 9; xiii., 189; xiv., 233; xv., 58, 174; xvi., 176.
Sapindus, vii., 37; ix., 54; xii., 62; xiv., 201, 223, 241.
Saponaria, xi., 95.
Saprólegnia, xii., 56.
Sarcocapnos, xv., 127.
Sarcodes, vii., 93.
Sargassum, xi., 30; xiii., 109; xv., 312.
Sarothamnus, x., 102.
Sarothra, xv., 234.
Sarracenia, vii., 18, 59, 83; viii., 92; xi., 92, 134; xiii., 251; xiv., 229, 231; xv., 133, 149.
Sassafras, vii., 67; x., 98; xiii., 36; xiv., 153; xvi., 289.
Saulcya, vii., 60.
Sauvagesia, xvi., 19.
Saurauja, xvi., 64.
Saururus, xi., 91.
Savastana, ix., 135.
Saxifraga, vii., 57, 60, 69, 99, 100; viii., 14, 121; ix., 55, 121; xii, 26; xiii., 72, 74; xiv., 122, 132; xv., 58, 93, 166, 175, 200; xvi., 176, 287.
Scabiosa, xiii., 83.
Scaphospora, ix., 67; xvi., 115.
Scandix, vii., 124; xvi., 176.
Scenedesmus, xiii., 93; xv., 157; xvi., 183.
Sceptronema, xvi., 76, 209.
Schænolirion, x., 35.
Schænoplectus, xvi., 83.
Schedonardus, ix., 135, 136, 153; x., 8.
Scheuchzeria, ix., 36; x., 67; xii., 53; xiii., 154.
Schinus, xvi., 191.
Schinszia, xiv., 199.
Schistostega, xvi., 331.
Schizæa, vii., 1, 22; x., 59; xiv., 12; xv., 201; xvi., 86.
Schizomycetes, xiv., 127.
Schizonema, xiv., 29, 32; xv., 129, 131.
Schizosiphon, viii., 38; ix., 70.
Schizoxylon, xi., 42.
Schkuhria, xi., 128, 130.
Schmidelia, xiv., 162; xvi., 191.
Schollera, vii., 29.
Schubertia, xvi., 59.
Schweinitzia, xii., 11.
Sciadium, xv., 157.
Sciadopitys, xi., 59.
Scilla, xiv., 53, 54, 56, 68.
Scinaia, xiii., 110.
Scirpus, vii , 1, 19, 114; viii., 28, 120; ix., 35, 151; x., 46; xi., 87; xii., 48, 105; xiv., 262; xv., 99, 101, 103, 297; xvi., 53, 290.
Sclerachne, ix., 134, 136; x., 35.
Scleria, xi., 32; xii , 40, 92; xiv., 187; xv., 104; xvi., 83.
Scleroderma, viii., 34, 64; xv., 326; xvi., 175.
Scleropelta, ix., 77.
Sclerotinia, xvi., 89.
Sclerotium, ix., 126.
Scoleotrichum, xiv., 246; xvi., 196.
Scoliopleura, xv., 129, 130, 131.
Scoliopus, xiv., 153.
Scolopendrium, vii., 85; x., 59; xiv., 16, 181.
Scolymus, vii., 125.
Scoparia, vii., 125; xiii., 239.
Scopelophila, xvi., 94.
Scoria, xv., 277.
Scorzonella, xvi., 152.
Scorzonera, xii., 90.
Scouleria, xvi., 93, 107, 307.
Scribneria, xiii 100.
Scrophularia, viii., 76, 133; ix., 5; xi., 122; xiii., 31, 60, 239; xiv., 129, 173.
Scutellaria, vii., 19, 28, 53; viii., 7, 76; x., 9; xii., 103; xiii., 116, 246; xiv., 68, 164, 235; xv., 172; xvi., 120.
Scutia, x., 35.
Scytosiphon, ix., 66; xiii., 107; xv., 311; xvi., 11.
Sebastiana, xiv., 162. xvi., 311.
Secotium, ix., 2; xv., 326.
Securidaca, xvi., 20.
Sedum, vii., 112; ix., 150; x., 83, 96; xii., 25; xiii., 43, 69, 70, 72; xiv., 261; xv., 93, 193, 299.
Selaginella, ix., 55, 91; xi., 8; xiii., 32, 82; xv., 203, 247.
Selinum, xiv., 40; xv., 224.
Sempervivum, ix., 90.
Senebiera, xiv., 164; xvi., 17.
Senecio, vii., 124; viii., 98; ix., 64, 140, 150; x., 36, 87, 135; xi., 103, 128, 129, 130; xii., 25, 103; xiii., 128, 188; xiv., 68, 146, 159, 163, 207, 234; xv., 17, 243, 299, 328; xvi., 44, 90, 118, 123, 228, 257, 283.

Senna, xiv., 56.
Septonema, viii., 28.
Septoria, ix., 74; x., 49; 97; xi., 73, 115; xii., 33; xiii., 86; xiv , 62, 105, 196, 244; xv., 145; xvi., 196.
Septosporium, ix., 133; xvi., 231, 254.
Sequoia, vii., 36, 79; viii., 51, 52; xi., 23, 84; xii., 75, 90, 91, 92; xiii., 35, 64, 99, 180; xv., 21; xvi., 147, 305.
Sericocarpus, vii., 11., xvi., 176, 340.
Serjania, xvi., 190.
Serpentaria, xiv., 128.
Serpyllifolia, xiv., 138.
Serratula, viii., 132; ix., 150.
Sesbania, ix., 142; xvi., 320.
Setaria, vii , 15, 101; viii., 120; ix., 77, 134; xiii., 84, 229, 230; xvi., 70, 231, 290.
Seymeria, xiii , 117.
Shepherdia, vii., 19; xvi., 70, 289.
Sherardia, xii., 48; xiv., 14, 219.
Shortia, xi., 136; xii., 10, 116; xiii., 226; xiv., 20; xv., 71, 165; xvi , 36, 59, 144, 175, 339.
Sibbaldia, xii., 26.
Sicyos, xii., 18; xiv., 155.
Sida, vii., 123; viii., 120; xii., 48; xiii , 70; xiv., 67, 101; xvi., 153.
Sidalcea, ix., 5; xi., 67; xiii., 96; xiv., 101; xv., 25, 200.
Sigillaria, viii., 63; xiii., 68.
Silene, vii., 34, 49, 123; viii., 9, 32, 36; ix., 149; xii., 26, 38; xiii., 115, 116, 189; xiv., 148, 151, 168, 196, 231; xv., 200; xvi., 61, 86, 287.
Silphium, vii., 101; viii., 132; xiii., 116; xiv., 151, 210; xv., 25, 267.
Silybum; vii., 35; xiv., 163; xvi., 47.
Simblum, vii., 8, 9, 11; viii., 95, 126.
Simmondsia, xv., 327.
Sinapis, vii., 20; xi., 35.
Siphonocladia, xv., 112.
Siphula, x., 23.
Sirosiphon, viii., 39.
Sisymbrium, vii., 11, 21, 27, 51; viii., 141, 142; xi., 53; xiii., 143; xiv., 209, 261; xvi., 16.
Sisyrinchium, viii., 46; ix., 150; x., 36; xi., 80; xiv., 145, 146, 150; xv., 17, 58; xvi., 45, 86, 270, 273.
Sitanion, x., 32, 78.
Sium, vii., 28, 87; xvi., 230.
Sloanea, xvi., 157.
Smelowskia, xii., 26.
Smilacina, viii., 92; ix., 36; x., 67; xii , 53, 103; xiii., 225; xiv., 237; xv., 58, 97, 136, 285; xvi., 189, 203.
Sobralia, xvi., 231.
Smilax, vii., 54; viii., 48; ix., 150; xii., 40; xiii., 84, 115, 117; xiv., 164; xv., 51, 58, 86, 96, 150, 162, 175, 189, 301; xvi., 59, 134, 179, 180, 205, 290.
Smyrnium, xii., 48; xiv., 79.
Sodiroa, xvi., 168.
Soja, xiv., 265.
Solanum, vii., 12, 125; viii., 120; ix., 150, 156; xi., 34, 82, 91, 104; xii., 118; xiii., 70, 151, 152; xiv., 18, 59, 64, 67, 131, 162, 219, 245; xvi., 59, 120, 136, 231, 283.
Solaria, xvi., 170.
Solenia, viii., 73.
Solidago, vii., 11, 12, 35, 53, 67, 82, 98, 112; viii., 29, 46, 53, 130; ix., 114, 150; x., 9, 34, 46, 66, 67, 105; xi., 49, 102, 103, 127; xii., 39, 48, 116; xiii., 60, 72, 73, 74, 75, 85, 116, 246; xiv., 87, 128, 164, 187, 188, 234, 244, 252; xv., 68, 136, 149, 321; xvi., 52, 138, 257, 264, 288, 314, 329.
Soliva, xvi , 46.
Sonchus, vii., 18, 53; xi., 94; xiv., 234; xvi., 44, 45, 289.
Sonnea, xiv., 100; xv., 299.
Sophora, vii., 37, 65; xii., 35; xiv., 154, 197; xvi., 325.
Sorastum, ix., 26; xiii., 93.
Sorghum, vii., 114; ix., 135, 136; xiv., 151, 223; xv., 117; xvi., 144, 240.
Sorosporium, x , 7.
Sparganium, vii., 12, 19. 114; viii., 28; xi., 90; xii., 40; xiii., 94; xiv; 182, 209, 237; xv., 1, 73.
Spartina, viii., 59; ix., 134; x., 75, 85, 95; xiii., 95; xiv., 237.
Spartium, xvi., 259.
Spathularia, ix., 1.
Specularia, ix., 36; xiv., 164.
Speirodela, xiii., 94.
Spergula, xii., 59; xiv., 147, 232; xvi., 44.
Spergularia, x., 121; xiii., 94; xiv., 261; xiv., 196.
Spermacoce, xii., 48.
Spermothamnion, xiii , 110.
Sphacele, xiv., 105.
Sphacelonia, xii., 109; xiv., 38, 245.
Sphacelaria, xiii., 108; xv., 112; xvi., 113.
Sphæralcea, xv., 239; xvi., 231.
Sphærella, viii., 124, 125; ix., 74; x., 75, 98, 117; xi., 73, 75, 120, 122, 123; xiv., 244; xv., 237.
Sphæria, vii., 90, 100; viii., 29, 52, 90, 125; ix., 73, 74; x., 53, 54 90, 96, 127; xi., 42, 74; xvi., 31.
Sphæronema, viii., 51, 65.
Sphæropiea, ix., 25.
Sphæropsis, x., 98; xiv., 244.
Sphærospermum, xii., 64.
Sphærotheca, xiv., 62, 193; xvi., 196, 257, 329.
Sphærozosma, vii., 44; xii., 1, 127; xv., 158; xvi., 185.
Sphærozyga, vii., 44; x., 14; xiii., 105; xv., 310.
Sphagnum, vii., 2, 3, 15; ix., 105, 106; x., 18; xi., 134; xiii., 152; xiv., 104; xv., 19, 186; xvi., 106.
Sphenophyllum, vii., 76; xvi., 336.
Sphenopteris, vii., 76; xvi., 173.
Spheralcea, xiv., 101.

Spicaria, x., 97.
Spigelia, xiii., 126; xv., 128.
Spinacea, xi., 58; xii., 87.
Spiræa, ix., 156; x., 96; xi., 36; xiv., 230, 232; xvi., 287, 330, 340.
Spiranthes, vii., 18, 54, 82, 98, 101, 114; viii., 28; x., 33, 34, 105, 121; xi., 36; xiii., 74, 189, 226; xiv., 236; xvi., 265.
Spirilium, ix., 25.
Spirogyra, vii., 47; viii., 37, 40; ix., 26; x., 15; xiii., 94, 99; xiv., 197; xv., 158; xvi., 116, 182, 184, 231.
Spirophyton, xii., 68.
Spirotænia, vii., 44; xvi., 25, 185.
Spirulina, ix., 25; xii., 129; xiii., 93, 105; xv., 310.
Splachnum, xiv., 250; xvi., 231.
Spodiopogon, xvi., 233.
Spoma, xiv., 8, 24, 67.
Spondias, xvi., 191.
Sporidesmium, viii., 51.
Sporobolus, vii., 19, 82, 98, 125; viii., 120; ix., 103, 104, 135, 136; x., 35, 46, 52, 63, 121, 128; xiii., 171, 225, 249; xiv., 8, 38, 100, 151; xv., 8, 49, 293, 295.
Sporocarpon, xv., 300.
Sporocybe, xi., 50.
Spraguea, ix., 31; xiv., 101.
Spyridia, xi., 30; xiii., 111; xv., 313.
Squamaria, xiv. 222.
Stachys, vii., 125; xii., 48; xiv., 150, 196, 235; xv., 94.
Stachytarpha, xii., 48.
Stanleya, xv., 213; xvi., 203.
Staphylea, vii., 49, 52, 74; ix., 144; xii., 82; xiii., 4, 116; xv., 93; xvi., 52, 56, 232, 340.
Statice, xi., 95; xv., 17.
Staurastrum, vii., 46, 91; viii., 2, 3, 40, ix., 27, 28; x., 19; xi., 13, 14, 16, 17; xii., 4, 5, 6, 51, 128, 133; xiii., 57, 59, 93; xv., 160; xvi., 188.
Stauroneis, xiv., 32, 70, 71, 72, 112, 141; xv., 131; xvi., 103, 104, 208.
Stauroptera, xiv., 71, 72, 112.
Staurospermum, ix., 26; xii., 127; xiii., 94; xvi., 184.
Staurothele, xi., 26.
Steganosporium, x., 76.
Steironema, xvi., 135.
Stellaria, vii., 13, 27, 58, 60, 123; viii., 48; ix., 36, 149; xi., 128; xii., 25, 32, 38, 48, 103; xiii., 6, 189; xiv., 14, 19, 147, 153, 231; xv., 193, 220; xvi., 61.
Stenochloa, ix., 135, 137.
Stenosiphon, xi., 115; xiv., 223.
Stenotaphrum, ix., 134; xii., 48.
Stephanodiscus, xiii., 124.
Stephanogonia, xvi., 76.
Stephanomeria, xiv., 16.
Stephanopyxis, xvi., 76.
Stereocaulon, xv., 184.
Stereopelte, xi., 25.
Stevia, xi., 128, 130.
Sticta, xv., 184.
Stictis, viii., 65; x., 76, 84.
Stictodiscus, xvi., 209.
Stigmaria, xvi., 173.
Stigeoclonium, vii., 48; xv., 156.
Stigmatidium, xvi., 105.
Stillingia, xiii., 126; xiv., 223; xvi., 67.
Stilbospora, xi., 18.
Stilophora, xi., 30; xiii., 109.
Stipa, vii., 82; viii., 76; ix., 88, 135; x., 8, 42, 63; xi., 125, 126; xiii., 53, 176; xiv., 99; xv., 49; xvi., 70.
Stramonium, xi., 54.
Strelitzia, xiii., 138, 139.
Streptanthus, xiii., 141, 142; xiv., 196; xv., 299.
Streptogyne, ix., 135.
Streptopus, ix., 114; x., 44; xiv., 236; xv., 188.
Striaria, ix., 66; xiii., 109.
Striatella, xiv., 28, 32, xv., 131.
Strobilomyces, xii., 33; xvi., 333.
Struthiopteris, viii., 114; ix., 6; x., 118; xiv., 181.
Stuartia, xv., 326; xvi., 59.
Strychnos, viii., 120.
Stylidium, ix., 117.
Stylyphorum, xiii., 115.
Stylosanthes, vii., 114; viii., 7; xii., 118; xiii., 69; xvi., 261.
Stytonema, viii., 38.
Suæda, x., 96; xiii., 246; xvi., 144.
Subularia, x., 34; xi., 118; xvi., 286, 291, 331.
Surirella, xiv., 141, 142, 175; xv., 131, 183, 220; xvi., 76.
Swartzia, xvi., 107.
Sycocarpus, xiv., 143; xv., 276.
Symblum, viii. 95.
Sympetaleia, xiv., 105.
Symphiostemon, xv., 17, 105.
Symphoricarpos, vii., 53; viii., 69, 114, 136; ix., 153; xii., 64; xv., 115, 128, 302; xvi., 59.
Symphonia, xvi., 63.
Symphytum, vii., 27, 125; xiv., 13, 59.
Symplocarpus, vii., 25; ix., 10, 84; xiii., 177; xiv., 140, 154; xv., 151; xvi., 89.
Synchytrium, xiv., 246.
Syndesmon, x. 57.
Synechococcus, viii., 37.
Synedra, xiv., 28, 32, 175; xv., 131, 183; xvi., 164.
Synthyris, xiii., 46.
Syringa, xiii., 203, 237.
Syrmatium, xiv., 16; xv., 243.
Systegium, vii., 7, 8.
Systemodaphne, xvi., 282.
Tabernæmontana, xiii., 203, 204.
Tacsonia, viii., 69.
Tæniopteris, vii., 76.
Tænitis, viii., 88; ix., 50.
Tagetes, xi., 35.

Talinum, viii., 121; ix., 153; xv., 214; xvi., 62.
Talisia, xvi., 191.
Tamarix, xiii., 252; xvi., 47.
Taphrina, xv., 94; xvi., 251.
Tapirira, xvi., 168.
Taraxacum, vii., 25; ix., 11, 24, 129; xi., 104, 129; xii., 48, 90; xiv., 62; xvi., 288.
Tauscheria, xiii., 218.
Tauschia, xvi., 122.
Taxodium, vii., 78; ix., 82; xiii., 179; xiv., 108, 132, 263; xv., 192, 202; xvi., 176, 199, 229, 333.
Taxus, vii., 20; x., 48; xi., 23, 36, 91, 139; xiv., 67, 186.
Tecoma, viii., 69; xiii., 116; xv., 203.
Tegeticula, xiii., 136.
Tellima, xi., 36.
Tephrosia, vii., 82, 93; viii., 120, 130; ix., 149; xi., 127; xiii., 5, 60, 69; xiv., 187, 188; xv., 328; xvi., 122.
Teramnus, xvi., 262.
Terfezia, xiv., 40.
Terminalia, xiv., 21; xvi., 310.
Ternstroemia, xvi., 63.
Terpsinoe, xiv., 141; xvi., 76, 209.
Testicularia, xii., 69.
Tetradymia, xi., 129.
Tetramitus, xiii., 102.
Tetranema, xvi., 120.
Tetrapteris, xvi., 158.
Tetraspora, xvi., 184.
Teucrium, viii., 130; xi., 116; xiii., 14, 31; xvi., 53.
Thalictrum, vii., 50, 83, 97; viii., 60; x., 56; xiii., 42, 60, 72, 100, 114, 189, 251; xiv., 121, 231; xv., 243; xvi., 13, 176.
Thamnium, xvi., 111, 124.
Thamnotettis, xiv., 260.
Thaspium, vii., 27, 87; xiv., 186; xv., 56, 58, 132; xvi., 122.
Thelesperma, xi., 104.
Thelia, xv., 186.
Theloschistes, xv., 184.
Thelyphora, viii., 48.
Thelypodium, xiii., 142, 143; xiv., 168, 196, 219.
Theobroma, vii., 25; xiii, 226; xvi., 155, 335.
Thesium, x., 89.
Thlaspi, xi., 54; xii., 38; xiii., 189; xvi., 149.
Thinouia, xvi., 191.
Thorea, xii., 15.
Thrysacanthus, xv., 172.
Thuidium, vii., 16; xv., 186.
Thuja, ix., 82; x., 48; xi., 22, 24; xii., 66, 67; xiii., 6, 36, 64; xiv., 197, 230, 237; xvi., 290.
Thunbergia, xi., 36.
Thurberia, ix., 134, 136; x., 35.
Thymus, vii., 53; viii., 8; xi., 47, 56; xii., 90; xiii., 84; xiv., 252.
Thysanocarpus, xiii., 218; xiv., 150.
Tiarella, viii., 80; ix., 114; xi., 36; xiii., 100.
Tiedemannia, vii., 87; xv., 56; xvi., 132.
Tigridia, vii., 83; xv., 300; xvi., 284.
Tilia, xi., 125; xii., 75, 89; xiii., 195; xiv., 102; xv., 316; xvi., 309.
Tillandsia, viii., 6; x., 35; xii., 79; xiv., 67; xv. 200, 224; xvi., 46, 168, 306.
Tilletia, xiii., 179; xvi., 173, 283.
Tilopteris, xvi., 116.
Timmia, xvi., 110.
Tipularia, xiv., 94.
Tissa, xvi., 62 125, 196, 205.
Tofieldia, x., 46; xi., 36; xiv., 237.
Tolypella, x , 109; xiv., 219; xv., 91.
Tolypothrix, vii., 44; viii., 39; x., 20; xv., 161.
Tonella, xiv., 192.
Torenia, ix., 50.
Torreya, xvi., 232, 305.
Tortula, xvi., 107.
Tounatea, xvi., 325.
Tournefortia, xii., 48; xiv., 67; xvi., 120, 145.
Tovaria, xv., 295.
Tovomita, xvi., 68.
Townsendia, vii., 112; ix., 5; xii., 25; xv., 276,
Trachynotia, ix., 134.
Trachypogon, xvi., 235.
Tradescantia, vii., 12; xii., 80; xiii., 30, 149; xv., 288; xvi , 45, 70, 131.
Tragia, xi., 82.
Tragopogon, viii., 75; ix., 36; xiii., 188; xiv., 186, 219; xvi., 70, 136.
Tragus, ix , 135, 136.
Trametes, xv., 146.
Trapa, xiii, 39; xiv., 252; xv., 300.
Trapella, xv., 300.
Trautvetteria, xiii., 73.
Trema, xiv., 67.
Tremella, xiv., 244.
Trentepohlia, xiii., 109; xv., 312; xvi., 30.
Tribeles, xvi., 170.
Tribilidium, xvi., 176.
Tribulus, xiii., 238; xvi., 158, 282.
Tricardia, ix., 92, 116, 117.
Triceratium, xiii., 225; xiv., 32, 57, 141, 142; xv., 131; xvi., 71, 76, 210.
Trichia, xiii., 180.
Trichilia, xvi , 168.
Trichloris, ix 135, 136, 146; x , 7.
Trichobasis, xi., 49.
Trichochloa, ix , 88.
Trichodon, vii., 16.
Tricholæna, ix., 75.
Trichomanes, vii., 16, 94, 95, 96; viii., 79; xii., 117; xiii., 87; xv., 248.
Trichophilus, xv., 25.
Trichophorum, xvi., 83.
Trichostema, viii., 35; x., 81, 136; xii., 39.
Trichothecium, xv., 25.
Tricuspidaria, xvi., 157.
Tricuspis, vii., 19; viii., 130; ix., 135, 137; x., 30.
Trientalis, xii., 102; xvi., 139.
Trifolium, vii., 1, 11, 122, 124; viii., 65, 71, 113,

142; ix., 23, 31, 74; x., 9, 67, 70; xi., 9, 76; xii., 25, 53, 101: xiii, 17, 28, 76, 83, 126, 188, 189; xiv., 13, 14, 105, 155, 196, 219, 232, 245; xv., 24, 93, 132, 200, 204, 241, 243, 287; xvi., 70, 149, 259, 287.
Triglochin, viii., 29; ix., 20; xii., 26; xiii., 153, 154, 246.
Trigonella, vii., 124; xiii., 48.
Trigonia, xvi., 20.
Trigynella, xvi, 14.
Trilepis, xvi., 83.
Trilesia, xi., 104.
Trillium, vii., 26; ix., 96, 114; x., 44, 57, 67, 71; xii., 101; xiii, 76, 99, 114, 115; xv., 136; xvi., 290, 340.
Triodia, ix., 135, 137; x., 30; xiv., 134; xv., 49, 117.
Triolena, xv., 115.
Triosteum, xiii., 60; xiv., 186.
Triplasis, ix., 135; xv., 117; xvi., 70.
Triplosporium, xv., 171.
Tripsacum, vii., 18, 114; viii., 132; ix., 134; xiii., 95; xvi., 70, 234.
Trisetaria, ix., 146.
Trisetum, ix., 135, 146; x., 64, 65; xi., 6; xii., 6, 25; xiii., 118.
Trisiola, ix., 135.
Triteleia, xiv., 15; xv., 93.
Triticum, viii., 46; ix., 119, 137, 153; x., 78, 128; xiii., 179; xiv, 86; xvi., 290.
Tritoma, viii., 68.
Triumfetta, xvi., 156.
Trixis, xi., 128.
Trollius, xii., 59.
Tropœolum, xi., 35; xiv., 88, 162; xvi., 45, 158.
Tropidocarpum, xv., 299.
Troximon, x., 88; xiii, 66; xiv., 196; xv., 58, 148, 243.
Tryblionella, xiv., 32, 141; xv., 131; xvi., 210.
Trypethelium, xv., 146, 170.
Tsuga, viii., 132; x., 47; xi, 22, 23; xiii., 148; xiv., 40, 247; xv, 128; xvi., 134.
Tuber, xiv., 40.
Tubercularia, xi., 74
Tuckermannia, xi., 98.
Tulostoma, xiv., 174.
Tussilago, viii., 142; xii., 101; xiii., 188, 195; xiv., 88.
Turritis, xiii., 142.
Tympanis, ix., 7.
Typha, vii., 64, 93; ix., 11; xiii., 94; xiv., 24, 150, 159, 209; xv., 1, 73, 149.
Udothea, xv., 142.
Ulex, xv., 245.
Ulmus, vii., 25, 26; xii., 40, 82; xvi., 289.
Ulota, xv., 176, 203; xvi., 109, 225, 231.
Ulothrix, vii., 48; viii., 40; ix., 26; x., 56; xiii., 106; xv., 156, 310.
Ulva, xi., 30, 130, 131; xiii., 106; xv., 19, 184, 310.
Umbilicaria, xiv., 134, 222, 248, 249.
Uncinula, xiv., 38, 82. 193, 245; xv., 115.
Ungnadia, x., 123.
Unifolium. xv., 285; xvi., 176, 203, 290.
Uniola, vii., 12; ix., 135; xiv., 150; xvi, 284.
Uralepis, ix., 135, 137.
Urbanodaphne, xvi., 282.
Urceolaria, xiv., 134.
Urceolina, xv., 203.
Urechites, xv., 236.
Uredo, viii., 29; x., 62; xii., 36, 131; xvi., 196.
Urena, xvi, 154.
Urginea, ix., 103; xiv., 55.
Uromyces, xii, 35; xv., 25, 149, 273; xvi., 37, 176, 308.
Urtica, vii, 17; viii., 122; xi, 58; xii., 48, 68; xv., 272; xvi, 45, 176.
Urvillea, xvi., 190.
Usnea, xv., 106, 172, 184.
Ustilago, x., 7; xii., 35, 69, 70; xvi., 173, 176, 196, 284.
Utricularia, vii., 17, 18, 19, 27, 82; viii., 98; x., 34; xi., 13, 82; xii., 11; xiii., 5, 84, 94, 103; xiv., 235; xvi., 264, 277, 286, 289, 331.
Uvularia, vii., 49; xiii., 115; xiv., 169; xv., 187.
Vaccaria, ix., 149; xii., 38.
Vaccinium, vii, 12, 18, 49; viii., 23, 46, 86, 91; ix., 140; x., 40, 44, 67, 76, 105, 120; xi., 75, 99, 100, 132; xii., 103, 114; xiii., 72, 76, 79, 83, 189, 204, 225, 240; xiv., 62, 171, 188, 235, 262; xv., 115, 128; xvi., 89, 202, 284, 289, 296, 330.
Vagnera, xv., 285.
Valeriana, viii., 46; x., 46; xii., 25, 87; xiii., 95, 115; xiv., 68, 79, 128, 164: xv., 17, 94.
Valerianella, xi., 36, 102, 104; xii., 53; xv., 325.
Vallisneria, vii., 12; xiii, 94.
Valsa, viii., 89; ix., 98, 99, 111, 112; x, 54, 89, 118; xi., 27, 28.
Valsaria, xi, 28.
Vancouveria, xiii., 180, 225.
Vanilla, xiv., 88.
Vasconella, xvi., 46.
Vaseya, ix., 88, 136.
Vatairea, xv., 138.
Vaucheria, vii., 47; x., 14; xiii., 109, 150; xiv., 53; xv., 312; xvi, 183.
Vauquelinia, xvi., 310.
Veatchia, xii., 11.
Veltheimia, xiii., 62.
Veratrum, xiii., 73; xiv., 62; xvi., 330.
Verbascum, vii., 28, 99, 100, 120; viii., 106, 135, 142; ix., 10, 24, 141; xi., 9, 115, 119; xii., 83, 84, 101; xiii., 83; xiv., 40.
Verbena, viii., 130; ix., 141; xi, 114, 128; xiii., 6, 74; xiv., 68, 148, 163, 164, 186; xv., 94; xvi., 289.
Verbesina, ix., 110; x, 24; xi., 103.
Vermicularia, xiv., 82; xv., 54, 143.
Vernonia, vii, 112; xi., 116, 122; xiii., 115; xiv. 159, 223; xv., 236; xvi., 88.
Veronica, vii., 27, 99, 100, 125; viii., 14, 135; x.,

108; xii., 48, 49, 53, 68; xiii., 95, 234, 238, 239; xiv., 13, 147, 219, 235; xv., 58, 132, 224.
Verrucaria, xiv., 248; xv., 170; xvi., 29, 330.
Vespa, viii., 68, 135.
Vesicaria, xii., 100; xv., 200.
Vetiveria, xvi., 241.
Viburnum, vii., 49; ix., 36, 133, 150; x., 67, 105; xi, 33, 56, 84, 103; xii., 12, 37, 39, 94; xiii., 6, 60, 73, 116, 238; xiv., 13, 188, 230, 233; xv., 133, 135, 204; xvi., 145, 288, 295, 329, 340.
Vicia, vii., 124; xii., 38; xiii, 17, 60, 83, 189; xiv., 67, 86, 232; xv., 132, 210; xvi., 262.
Victoria, xiv., 250; xvi., 338.
Vigna, vii., 124.
Viguiera, ix., 15; xii., 35; xvi., 283.
Vilfa, ix., 103, 104, 135, 136; x., 7, 52, 63; xv., 293.
Vinca, xvi., 89.
Vincetoxicum, ix., 106, 115, 120; xii., 60; xiv., 175.
Viola, vii, 1, 26, 27, 34, 49, 52, 73, 74, 98, 114; viii., 23, 47, 68, 144; ix., 60; x., 9, 57, 66, 120, 121, 136; xi., 35, 59, 60, 83, 84; xii., 38, 53, 101, 103, 136; xiii., 6, 73, 85, 194, 225; xiv., 21, 22, 76, 83, 102, 127, 231; xv., 136, 176; xvi., 17, 18, 123, 149, 164, 179, 203, 243, 267, 278, 339.
Virgaria, x., 97.
Viscainoa, xv., 93; xvi., 56.
Viscum, xi., 77.
Vismia, xvi., 62.
Vitis, viii., 116; ix., 11, 23, 156; x., 9; xi., 41, 132, 133; xii., 38, 82; xv., 24, 93; xvi., 190, 230, 258, 287.
Vittaria, viii., 79; xv., 252.
Vochysia, xiv., 170; xvi., 20.
Voltzia, vii., 76.
Volutella, ix., 20, 98; xiv., 130.
Volvaria, xii., 37.
Volvox, ix., 94; xi., 10; xv, 156; xvi., 258.
Volvycium, xii., 37.
Vriesea, xvi., 168.
Wahlenbergia, viii, 119, 142.
Waltheria, vii., 113, 123; viii., 120; xiv., 167; xvi., 155.
Washingtonia, xi., 69; xii., 76; xvi., 86.
Webera, xv., 186, 243.
Websteria, xiv., 135; xv., 99; xvi., 83.
Weisia, vii., 4, 5.
Weissia, xvi., 109, 331.
Wellingtonia, xiii., 180.
Whippiea, viii., 23.
Willemoesia, xiv., 175.
Williamsonia, xiii., 37.
Windsoria, ix., 137.
Wissadula, xvi., 153.
Wistaria, xiv., 208.
Wollia, vii., 64, 65; viii., 108; xiii., 94.
Wolfiella, vii., 61, 64, 65.
Woodsia, vii., 85; viii., 36, 79, 89, 111, 116; ix., 22, 50, 68, 92; xi., 8; xii., 24; xiii., 61, 135; xiv., 83, 164, 181; xv., 229; xvi., 52, 290.
Woodwardia, vii., 27; viii., 47, 89; ix., 21; x., 46; xiv., 181.
Wyethia, viii., 75; xii., 25; xiv., 241.
Xanthidium, vii., 47; viii., 40; ix., 29; x., 17; xi., 16; xii., 3, 51, 133; xiii., 57, 93; xv., 159; xvi., 118, 186.
Xanthium, vii., 19; viii., 71; x., 120; xi., 68, 103; xiii., 60, 70; xiv., 245; xvi., 145.
Xanthorrhiza, xiii., 47.
Xanthosoma, xiii., 194.
Xanthoxylum, ix., 149; xi., 64., xvi., 309.
Xerochloa, x., 85.
Xerophyllum, viii., 7; ix., 74, 119, 133.
Xylaria, xi., 115; xv., 184.
Xylobium, xvi., 340.
Xylopia, xvi., 14.
Xylosteum, xv., 128.
Xyris, vii., 82, 98; x., 35; xvi., 124.
Yucca, xi., 41; xii., 47, 120; xiii., 135, 151; xiv., 197, 201, 241, 252; xv., 149, 203, 224; xvi., 59, 139, 205, 282.
Zamia, xiii., 194.
Zamites, xii., 91.
Zamouromeia, xv., 242.
Zannichellia, vii., 54; ix., 36; xiii., 159; xiv., 197; xv., 116; xvi., 134.
Zanthoxylum, viii., 71; x., 90; xi., 91; xv., 242 xvi., 160.
Zauschneria, viii., 75; xiv., 41, 105.
Zea, ix., 134; x., 49; xiv., 86, 241; xvi., 199.
Zebrina, xv., 94.
Zephyranthes, xiii., 225; xv., 273.
Zexmenia, xv., 242.
Zizania, vii., 19; viii., 28, 180; ix., 134; xiii., 14; xiv., 241; xv., 117.
Zizaniopsis, xv., 117.
Zizia, vii., 26, 52, 87; xi., 84; xv., 57.
Zizyphus, xiv., 87; xvi., 282.
Zoogloea, xii., 124.
Zornia, xvi., 261.
Zostera, ix., 66; xi., 30, 131; xiii., 111, 139; xv., 312.
Zygadenus, vii., 97; viii., 6, 45, 46, 123; ix., 98; x., 69; xii., 25.
Zygnema, vii., 47; ix., 94; xii., 126; xiii., 94; xv., 157.
Zygodesmus, xi., 17.
Zygodon, xvi., 331.
Zygogonium, vii., 47; viii., 40; x., 15; xv., 157.
Zygopetalum, xvi., 232, 258.
Zygophyllum, xiii., 238.
Zythia, xiv., 244.